Producer Walter Afanasieff · Nashville Recording · Pro Tools 5 Review

An INTERTEC /PRIMEDIA Publication

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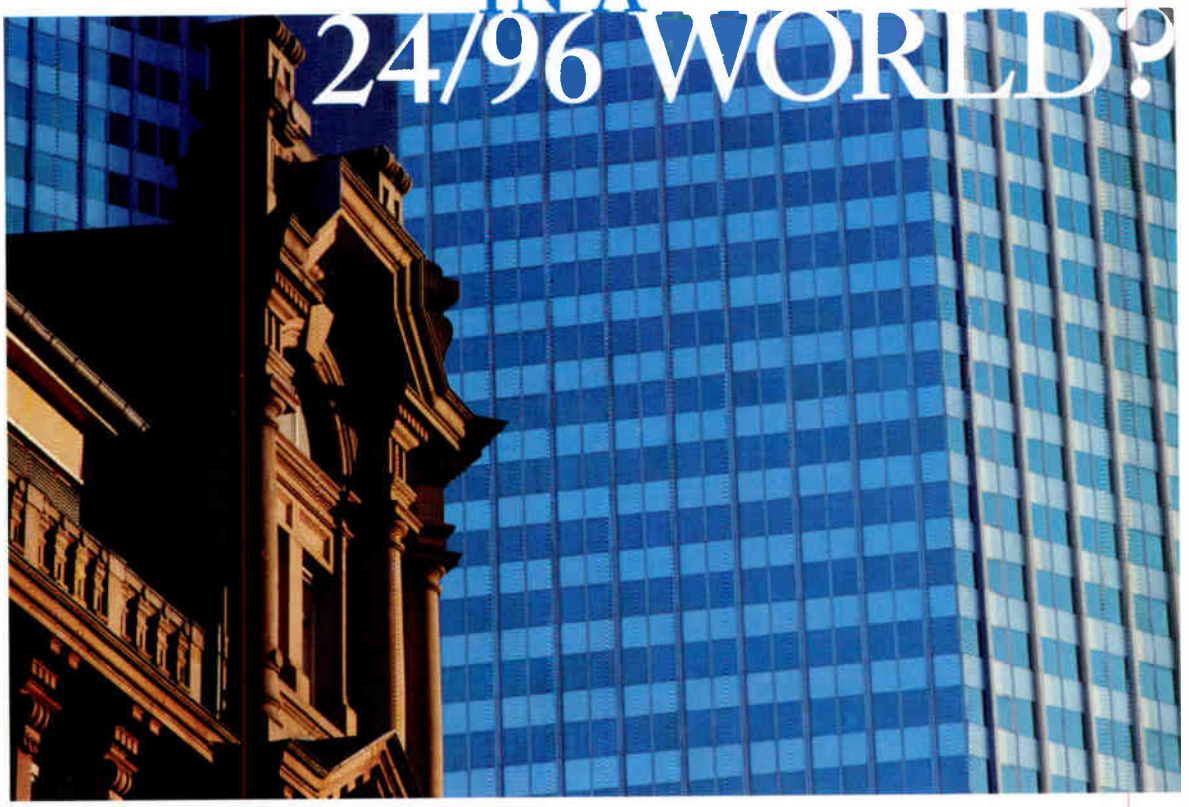

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CIRCLE #001 ON PRODUCT INFO CARD

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Rob Jacobs (right) with assistant engineer David Ashton in Studio 3

Also at Record Plant: The SL 9000 J in Studio 4

With a second SL 9000 J now installed, Hollywood's legendary Record Plant recently played host to Rob Jacobs, the original engineer on Don Henley's classic 'End of the Innocence'. Rob's task was to re-record a 5.1 surround mix of the album for a DTS CD release. "I'm just blown away by the sound and its capacity for signal routing," reports Jacobs. "I can't imagine doing this project on anything but a 9K. I don't think there's any board that is quite as versatile that sounds this good."

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CIRCLE #002 ON PRODUCT INFO CARD

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G R E A T

EXPECTATIONS

The Proto-J compact playback monitor packs a tremendous amount of quality and features into a small package. The extended low frequency response, controlled dispersion and dynamic character of Proto-J make it ideally suited for 5.1 format project studios. The system employs a durable 6.5" mid / bass driver and a new 3/4" high frequency, smartly housed in a front ported reflex enclosure. Each cabinet employs integral threaded inserts on the rear of the cabinet (Omni®50 Series spacing) for ease of installation and surround system alignment. Best of all - they're truly affordable!

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FOR THOSE WHO KNOW

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PROFESSIONAL RECORDING · SOUND AND MUSIC PRODUCTION

JULY 2000, VOLUME 24, NUMBER 7

AUDIO

PAGE 66

PRODUCTS

PAGE 126

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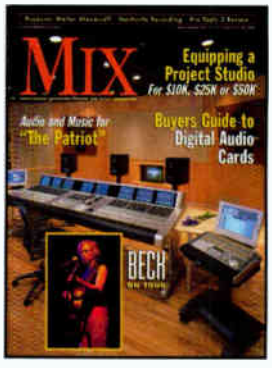
SOUND FOR PICTURE

LIVE SOUND

DEPARTMENTS

On the Cover: Emerald Recording recently installed a Euphonix System 5 digital console in the Emerald/Masterfonics building's Mix Room. For more information on Emerald and other Nashville facilities see "Nashville Recording" on page 88. **Photo:** Ron Neilson. **Inset:** Steve Jennings.



Check out Mix Online!
http://www.mixonline.com

Mackie's new standalone 24-track digital hard with any analog or digital mixer...and records on each affordable M•90 pull-out cartridge!

The new HDR24/96 is the affordable alternative to expensive, complicated digital audio workstations... and the natural successor to tape-based 8-track digital recorders. You get:

- A familiar, analog recorder interface – just hit PLAY and then RECORD;
- 24 tracks and 192 virtual takes (8 per track);
- Built-in internal hard disk with over 90 minutes of recording capacity[1]...
- ...plus a pull-out Mackie Media drive bay that uses affordable M•90 cartridges with 90-minute capacity[1];
- 24-bit accuracy with 44.1 and 48kHz sample rates[2];
- Sample-accurate sync for slaving any number of HDR24/96s together and locking to SMPTE, NTSC and PAL black burst, MIDI or internal work clock;
- Standard 100BaseT Ethernet output port;
- Two sizes of optional remotes;
- Analog, ADAT™, TDIF and AES/EBU I/O via mix-and-match 8-channel cards including our new $99[3] OPT I/O•8 card.

Built-in graphic waveform editor.

The HDR24/96 is also a full-featured digital audio workstation with waveform editing. Just plug in a monitor, keyboard and mouse! No extra computer or software needed.

Slide, edit, copy, group and crossfade tracks minutes after unboxing your HDR24/96 with an interface so intuitive you many not even have to crack the manual.

We've included 999 levels of undo (all operations are non-destructive so you can experiment to your heart's content). Regions and Super-Regions, unlimited cue points, track grouping, quantization, Cue, History, Group and Region list displays, drag-and-drop crossfades/fade-ins /fade-outs, Time Bar with user-defined resolution, Punch, Loop, Cue and Tempo Change markers, 8 virtual "takes" per track and many other music production tools.

The HDR24/96 on-screen display duplicates every front panel control including meter bridge and features true scrolling tracks you can view in groups of 24, 12, 8, 4 or 2.

Superior audio specifications.

Whether or not you immediately take advantage of the HDR24/96's workstation capabilities, you're getting a sonically-superb 24-track digital recorder for less than the price of three tape-based 8-track boxes. Consider these HDR24/96 specs: 0.00001% THD. 144dB internal dynamic range. 2Hz to 22kHz frequency response ±0.5dB. The HDR24/96 also has

Plug and Play! Think of M•90 media as 24-track tape cartridges that are so affordable you can keep one for each project. Or record on the HDR24/96's internal hard disk and use M•90's for lighting-fast back-up at many times the speed of typical SCSI transfer to Jaz® or magneto-optical disks.

And it's also a full-fe

disk recorder works over 90 minutes

blazing-fast internal processor speed for fast multitrack punch-ins.

Easy back-up.
Equally as important, the HDR24/96 is the first hard disk recorder to satisfactorily address the problem of transfer and storage. Its built-in Ethernet "*HDR Bridge*" lets you FTP data from the recorder to your computer's desktop, existing SCSI peripherals and the outside world at the near-realtime speed of 100Mb/second. The reasonable cost of our pull-out M•90 media cartridges means you can afford to have one for each project.

And, unlike expensive, cream puff SCSI drives, our UltraDMA Mackie Media can handle severe impacts, so you can treat (and abuse) them just like tapes.

A real value when all factors are considered.
We firmly believe that the HDR24/96 is the best digital recording buy on the market today…in spite of the fact that others are touting lower "base prices" for their products.
Consider the reasons:

- The HDR24/96 ships with twice as much recording capacity as some competitors' models.
- It uses pull-out media that are significantly less expensive than the competition's SCSI drives;
- It uses standard Mackie D8B I/O cards that start at just $99 for eight channels;
- For the price of a monitor, keyboard and mouse, the HDR24/96 becomes an intuitive waveform editing platform. You don't need to add a computer and deal with interface hassels.

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CIRCLE #004 ON PRODUCT INFO CARD

FROM THE EDITOR

IT'S IN THE CARDS

Computers have been creeping steadily into control rooms for years. Initially, they were mainly used to run console automation—unless you had one of those elite rooms that could afford a Fairlight CMI or NED Synclavier. Around 1984, as MIDI came on the scene, a sequencer was pretty much *de rigueur*, and another computer screen became a regular studio denizen. With the rise of affordable samplers and DAT recorders, the need for sample tweaking and/or digital 2-track editing was a must—bringing more computers into the workplace.

Now that MIDI sequencers have incorporated digital audio recording/playback and multitrack DAWs are commonplace, the computer has a firm foothold—if not a stranglehold—on the control room. Along with this infiltration of computers into studios, there are plenty of products that incorporate CPUs into their designs while putting the overall systems into user-friendly packages, such as Otari RADAR, Mackie Digital 8-Bus and Euphonix System 5.

Today, memory is getting cheaper and CPUs are becoming more powerful, while a new breed of affordable digital cards in the Mac/PC-compatible PCI bus format open up a world of possibilities for software developers, allowing users to pick and choose from any combination of I/O requirements—and/or DSP functionality—to suit individual needs. With the availability of onscreen mixing and signal processing, the computer in many cases becomes the *entire* studio, with all operations taking place within the desktop—or laptop!

Having offered computer-based alternatives for nearly every piece of studio gear (which today even includes speaker and microphone emulations!), manufacturers are now offering virtual replacements for musical instruments. Cutting-edge new designs include Seer Systems' SurReal and Koblo's 9000, but re-creations of classic gear, such as Bomb Factory's Voce Spin (Leslie simulation) and Native Instruments' Hammond and Prophet-5 clones are the next step, and we'll surely see more at this month's NAMM show in Nashville.

There's no shortage of cool virtual stuff, so selecting a digital audio card is an important purchasing decision. With that in mind, Randy Alberts offers a "Buyer's Guide to Digital Audio Cards," profiling dozens of products on the market. Meanwhile, our resident *techmeister* Eddie Ciletti takes a number of new audio cards and related products out for a test drive.

In choosing any piece of (virtual or actual) gear—whether a digital console, tube microphone, a basic I/O device to transfer audio to/from your CPU or a DSP-laden PCI card with onboard converters and sync functions—the same rules apply. Pricing and features are issues, but concerns about performance and reliability are still major considerations for pro users. Fortunately, some things never change.

See you at NAMM,

George Petersen

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FEEDBACK

LEARN FROM A MASTER

It was a pleasure (faaantastic!) to read the "Biograph" on Milan Bogdan ["Business Quarterly" section, May 2000]. Having worked with him on a number of occasions, I can only add that words in a magazine, even as good as *Mix*, cannot begin to do the story justice.

Milan has more charisma (in the truest sense) in the control room than any other recording professional I've ever worked with. He's all knowledge and great attitude. He can stroll up to any console, push up the faders and really make magic happen! If anybody can mix oil and water, Milan can.

Today's engineering community could take a few lessons from engineers like Milan. As for me, the sessions I did with Milan and others he taught along the way were absolutely the most meaningful ever. Thanks again for drawing attention to this faaantastic gentleman.

Will Eggleston
Genelec Inc.

AN FOH ON IEMS AND UAMS

Thanks to Mark Frink for another interesting and informative article on in-ear monitoring ["Are IEMs 4U?" Feb. 2000]. Here are a few observations on things covered and not covered in the piece.

As an FOH engineer, I have used the mic and DI on the guitar amp technique. You are right on all counts on that one—it does sound great when split over a stereo image, although it's difficult to get guitarists to accept the use of a DI on "their sound." Perhaps hearing this through IEMs will help to change that.

The use of "shakers" mounted on drum stools, etc.—I call them UAMs—is becoming an integral part of the IEM world. I'm using the Clark Synthesis TST-329-F for all four musicians in the house band on a TV show I work on. These things are amazing. Everything that Stephen St.Croix said about them in his *Mix* article "How Low Can You Go?" ["The Fast Lane," March 1999] is true. We attached one to the drum throne with another three attached to the underside of a panel each player stands on. The panels are inset into their respective parts of the stage for a flush mounting.

On the drum throne, I was able to mount the unit by actually using it to replace the height adjustment locking knob. By some happy accident, the threads on the locking knob were identical to those provided with the shaker. I was able to remove the locking knob and replace it with the shaker, which just fit between the legs of the throne and the bottom of the seat. The whole job took about two minutes and worked beautifully until a few months ago when the drummer showed up with a new throne ("check it out, man—it's hydraulic!"). That required a new mount to be devised, half an hour before show time.

These things are "full range" devices and need to be crossed over at around 125 Hz. I am not using the highpass on the crossover to feed the IEMs, so these overlap with the shakers below 125 Hz. I haven't had a chance to delve into this, but when I was testing this out, I did notice another "time" issue. That is, there appears to be a small time delay between your feet and your head, even through bone conduction, and this has some relevance to the issue Mark touched on in the last part of his article.

Finally, I'd like to address how these advances in technology affect our jobs and the audience. A couple of years back, I saw Sarah McLachlan at the Hummingbird Centre here in Toronto. Sitting there in a big soft-seater, listening to the mix and watching Gary [Stokes] at the [FOH] console, I realized how far we've come since the days of trying to get a mix together over the stage volume. Here was a band with almost no stage volume.

The result? Well, first of all, it puts the FOH engineer (and probably the monitor engineer as well) in the position of basically having to mix the record every night. Remember when that was the fastest, simplest answer to the classic yokel question of "what do you do with all of this stuff, anyway?" Easy answer: "I try to make the band sound like the record."

Gone are the days when—if you were busy with something else when the guitar solo came up—you would hear it off the stage first and then cheat the fader up, with no one the wiser. Now you may find yourself doing in 90 minutes what it took four people, using full automation, weeks or even months to create a mixed master. I often found myself thinking about how much easier mixing would be if I just had more control over what was coming off the stage...Be careful what you wish for.

Between IEMs, drum baffles, offstage amplification and the tyranny of preprogrammed moving lights, we have succeeded in turning what we used to call "rock concerts" into what amounts to a full-length, live-action video of the CD. I'm not saying that this is all a bad thing. I saw k.d. lang's Ingenue tour in the same hall, and it was one of the best performances I've seen. I do believe, though, that we all should be aware of the trade-offs between repeatability and spontaneity. None of this is meant to be criticism, just food for thought.

Ike Zimbel
via e-mail

OFFLINE READER

Your April 1999 issue included an article about George Petersen's trip to Frankfurt, Germany ["Ten Product Hits From Musikmesse"]. I am interested in the speaker system called MusicaNova 2001. I do not have an Internet connection, so I am writing to ask you to print the address or fax so I can contact the company.

All in all, I love *Mix* magazine; it is the best professional music magazine ever.

Ivor Jude
Swaziland, South Africa

We're glad to know our Swaziland audience is enjoying Mix *and hope that it didn't actually take a year for our April 1999 issue to reach you. You can write to the manufacturer of MusicaNova 2001, ML Audio & Carbons, at Windhauserweg 10, Essenheim, Germany D-55270, or phone 49/0/6136/885-81.*

—George Petersen

Send Feedback to Mix, *6400 Hollis St., Suite 12, Emeryville, CA 94608; fax 510/653-5142; or e-mail mixeditorial@intertec.com.*

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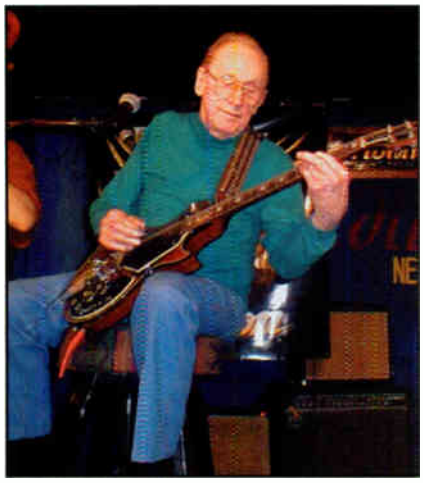
The Academy of Motion Picture Arts and Sciences has recognised the AMS Neve DFC as the first fully digital audio mixing console specifically designed for post-production film mixing.

The Scientific and Engineering Award for 1999 – presented to Mark Crabtree, Huw Gwilym and Karl Lynch of AMS Neve plc for the design of the DFC

CIRCLE #005 ON PRODUCT INFO CARD

CURRENT



HAPPY 85TH BIRTHDAY, LES PAUL!

Les Paul, the father of the solid-body electric guitar and the inventor of multitrack recording, celebrated his 85th birthday (June 9) with two sold-out performances at New York City's Iridium jazz club, where he plays every Monday night with the Les Paul Trio. Les will appear at this year's TEC Awards in Los Angeles during AES to present the Les Paul Award for this year's recipient, Sir Paul McCartney.

DIGITAL HARMONY PICKS UP PAVO LABS

Digital Harmony Technologies Inc., a third-party licensor of FireWire technologies, has acquired PAVO Labs, a technology and product development firm specializing in professional audio products and musical instruments. Through this acquisition, Digital Harmony Technologies will gain access to PAVO's patent portfolio and experience in product certification testing. Digital Harmony Technologies will make these new assets available to its family of licensees, which includes Harman International Industries, Boston Acoustics, Columbia Records and Peavey Electronics. PAVO Labs, under terms of an exclusive contract with the MIDI Manufacturers Association (MMA), is currently the worldwide certification test center for products conforming to the Downloadable Sounds (DLS) industry standard for Internet audio playback devices.

Greg Bartlett, president of Digital Harmony Technologies, stated, "By merging the two companies, we can take advantage of a common licensing program, reduce the time-to-market of exciting new products, and better serve our partners and investors." For more information visitwww.digitalharmony.com.

TODD-AO CLOSES DEAL WITH LIBERTY MEDIA

The Todd-AO Corporation, which specializes in motion picture and television post-production, announced that it has changed its name to Liberty Livewire Corporation. The change became effective with the closing of the company's previously announced transaction with Liberty Media Group, through which Liberty Media acquired a controlling interest in Todd-AO.

David Beddow, Chief Executive Officer of Liberty Livewire, noted, "[The] closings mark our initial steps in building a dynamic company to service the post-production and distribution needs of a wide array of media clients, including motion pictures, long-form television and commercial advertising. While we continue to strengthen the traditional film, video and sound services areas, we are adding the capability to offer large-scale Internet hosting, IP distribution and caching through our venture with HyperTv and the network capabilities of AT&T."

Liberty Media holds interests in a broad range of video programming, communications, technology and Internet businesses in the United States, Europe, South America and Asia. For further information, visit the Liberty Media Group online at www.libertymedia.com.

TC ELECTRONIC UNVEILS HELICON

TC Electronic, in a partnership with Canadian IVL and Danish TC Electronic, has announced the formation of a new company, Helicon Vocal Technologies Inc. The focus of the new company will be the development of vocal processing technologies. Equipment manufactured under the new imprint will utilize TC Electronic's existing sales and distribution channels. Helicon will also have full access to the algorithms, technology and expertise of both TC Electronic A/S and IVL Technologies Ltd. The first product releases are scheduled for the third quarter of 2000. For more information visit www.tceclectronic.com.

DOLBY POSTS GUIDELINES FOR PRODUCING SURROUND MUSIC

Anticipating the imminent release of DVD-Audio discs, Dolby Laboratories has posted a white paper entitled "Some Guidelines for Producing Music in 5.1 Channel Surround" in the Technical Information section of its Web site. The paper is posted as a downloadable Adobe PDF file.

"While many surround-sound mixes have been created for movies, 5.1-channel mixing for music is a relatively new field, one that presents us with many questions and choices," said John Kellogg, general manager, multichannel audio and music.

The white paper describes the origin of multichannel audio in the cinema, the differences between mixing for film and for music and how to set up a 5.1-channel monitoring environment. It also provides suggestions on how music mixers might best employ the format's six channels. Additional information related to DVD-Audio sound mixing can be found in the "Dolby Digital Professional Encoding Manual," also available in the Technical Information section of Dolby's Web site.

For further information, visit www.dolby.com or call 415/645-5000.

QSOUND LABS EXPANDS DISTRIBUTION AGREEMENT WITH REALNETWORKS

QSound Labs Inc., a provider of enhanced Internet audio solutions, recently announced the expansion of its distribution agreement with RealNetworks Inc. with the official release of iQfx2 and iQfx2 Plus—the Company's newest Internet 3D audio software. The expanded agreement provides all RealPlayer, RealPlayer Plus, RealJukebox and RealJukebox Plus users with the opportunity to download iQfx2 and/or iQfx2 Plus. The iQfx2 Plus is avail-

—CONTINUED ON PAGE 16

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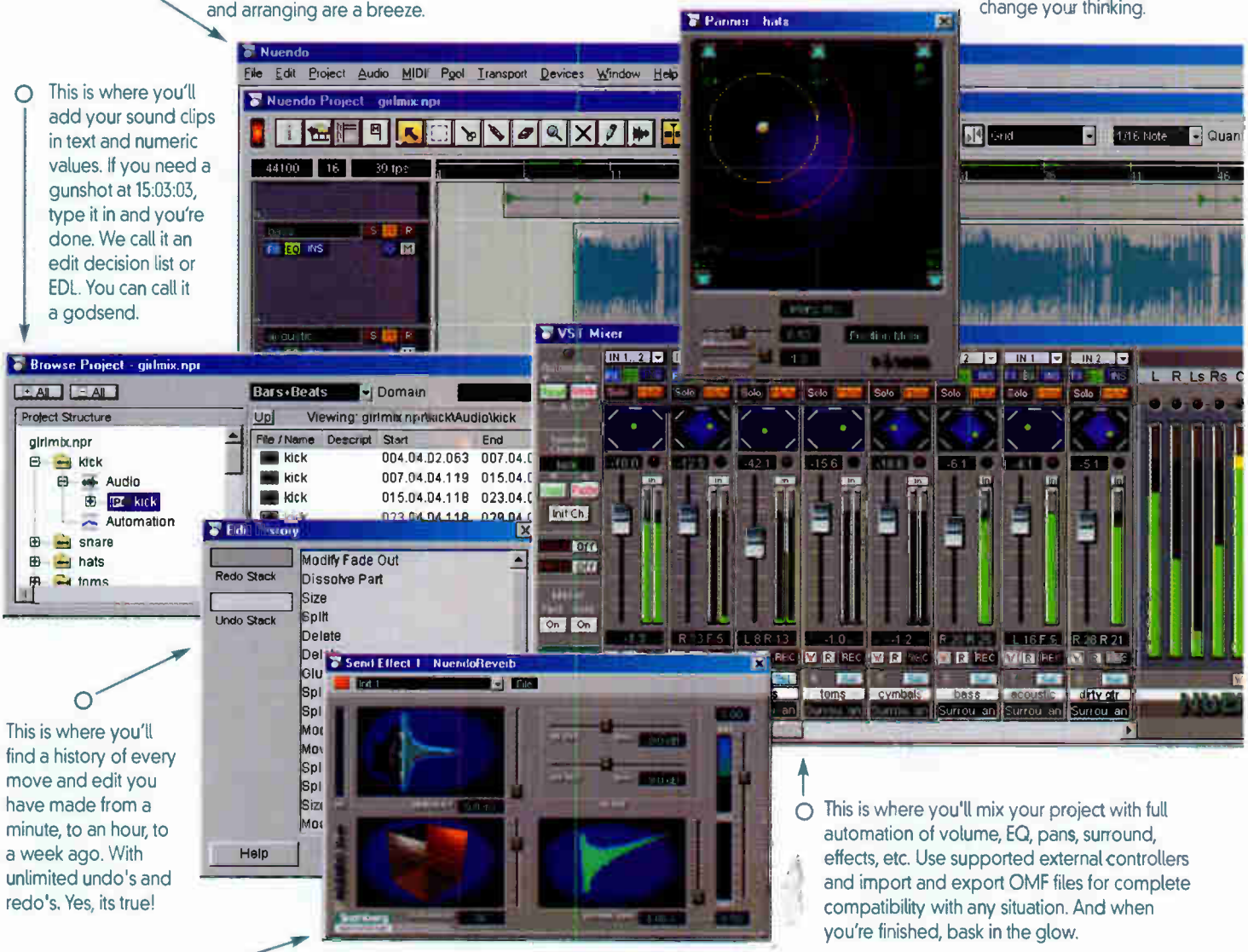

This is where you'll find a history of every move and edit you have made from a minute, to an hour, to a week ago. With unlimited undo's and redo's. Yes, its true!

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INDUSTRY NOTES

Euphonix (Palo Alto, CA) has promoted **Christopher M. Pelzar** to the position of VP, Eastern region. The Euphonix System 5 was also recently awarded the Studio Sound Audio Industry Recognition Award in the large-scale console category...**Mackie Designs Inc.** (Woodinville, WA) has promoted **Jay Schlabs** to the position of national sales manager... **DSP Media Inc.** (Studio City, CA), manufacturer and distributor of audio post-production systems, recently announced the promotion of **Terry Marshall** to VP of worldwide sales...**Patrick Wilson** will be the new VP of business development at DTS (Agoura Hills, CA), provider of multichannel audio for entertainment...**G Prime** (New York City), distributor of pro audio systems, has appointed **Scott Jones** VP of sales... Audio equipment rental and consultation company **The Toy Specialists** (New York City) has tapped **Roger Keay** to be its new chief technical engineer...**Numark** (North Kingstown, RI), manufacturer of high-end disc jockey technology, has brought **Christopher Bastien** on as marketing manager...**Jeff Klopmeyer**, formerly of Alesis, will be the new advertising/marketing manager at Tascam (Montebello, CA)...Pro audio provider, **Nexo USA** (San Rafael, CA) has brought on **David Solari**, formerly of Meyer Sound, as its new chief operating officer; **Jim Sides** was also appointed executive VP of sales and marketing. In other Nexo (Surrey, UK) news, the company has appointed **Group Technologies** (Victoria, Australia) as its Australian distributor...**TC Electronic** (Westlake Village, CA) has appointed **Stephan Israel** international marketing manager...**HHB** (Los Angeles) has tapped **Ruth Spencer** to be its new East Coast sales executive...**Sennheiser USA** (Old Lyme, CT) has appointed **Greg Beebe** channel manager, **Rick Belt** RF wireless product manager and **Kent Margraves** market development representative.

In other Sennheiser news: **Full Compass Systems** (Middleton, WI) was presented the 1999 outstanding sales award; **Mars Music** (Fort Lauderdale, FL) was named the 1999 MI products dealer of the year; the 1999 broadcast dealer of the year was **Dale Electronics** (New York City); **Location Sound** (North Hollywood, CA) was the film and video professional products dealer of the year for 1999...**Sacred Noise** (New York City) has added producer **Michael Montes** to its staff... **Klipsch LLC** (Indianapolis, IN) will now be represented in the middle Atlantic region by **ASR Enterprises Inc.** (West Chester, PA)...Rep and distribution announcements at **Littlite** (Hamburg, MI), a pro audio and lighting manufacturer: **Fuzion PLC** (Surrey, UK) export distributor of the year, **Audio Video Associates** (St. Louis, MO) Midwest rep firm, **New England Technical Associates** 1999 rep of the year...Shure Brothers Inc. has shortened its name to **Shure Inc.** (Evanston, IL) and announced the launch of the company's revamped Web site, www.shure.com...**Denon Electronics** has moved its U.S. operations to 19 Chapin Road P.O. Box 867, Pine Brook, NJ 07058-9777 phone: 973/396-0810. Denon has also named two new rep firms, **Plus 4 Marketing** (Concord, CA) and **Audio Associates** (Columbia, MD)... **Apogee** has opened two new offices in London and New York; the new addresses are: 15 Percy Street, London W1P OEE, UK; phone: 44/(0)20/7291-9180 fax: 44/(0)20/7291-9181; and 1826 Second Avenue, PMG 168 New York, NY 10128; phone: 212/831-8910; e-mail: newyork@apogeedigital.com. The company has launched a redesigned version of its Web site, www.apogeedigital.com...**One/eleven** (San Francisco), a post-production facility, has promoted two of its own: **Chris Pinkston** studio manager/first engineer and **Jennifer Belkus** production services director. ■

—FROM PAGE 12, CURRENT

able for download from both Real.com (www.real.com/accessories) and QSound.com (www.qsound.com/products/iqfx2.asp). For more information, visit Qsound Labs on the Web or call 403/291-2492.

SUMMER NAMM

Boasting more than 20,000 attendees and more than 50 Pro Audio and Lighting exhibits, Summer NAMM is returning to the Nashville Convention Center July 21-23. This year's convention will also include a number of industry-specific seminars with topics pertaining to retail business practices, multitrack recording, the DJ business and more. For more information, visit the NAMM Web site at www.namm.com or call 800/767-6266.

BERNARD KORNBLUM, 1900-2000

St. Louis Music Inc. founder Bernard Kornblum died of heart failure at the age of 99. Kornblum immigrated to the U.S. from Vienna in 1919 and, at the age of 24, began importing musical instruments from Germany. In 1929, together with his brother and sister, he bought out a sheet music company named St. Louis Music. Kornblum was involved with the music industry for more than 75 years. In the 1940s he founded the Music Sponsors, a music festival for St. Louis city and county orchestras, bands and soloists. In his own words, "When I got into the music business, I wasn't thinking about making money. I was thinking about realizing a dream that I had and a vision of getting into something I loved."

Kornblum is survived by his wife of 66 years, Myrtle Kornblum; his son, Gene Kornblum; his daughter, Carole Simon; and five grandchildren.

CORRECTIONS

There were a few errors in the May 2000 article "Network Systems 2000": The SC-10 is a subcommittee; work stopped on the AES-24 early last year; SC-10 does have a supportive liaison with ESTA's ACN working group, and the group is working on the issue of common audio data types. *Mix* regrets any confusion these errors might have caused. ■

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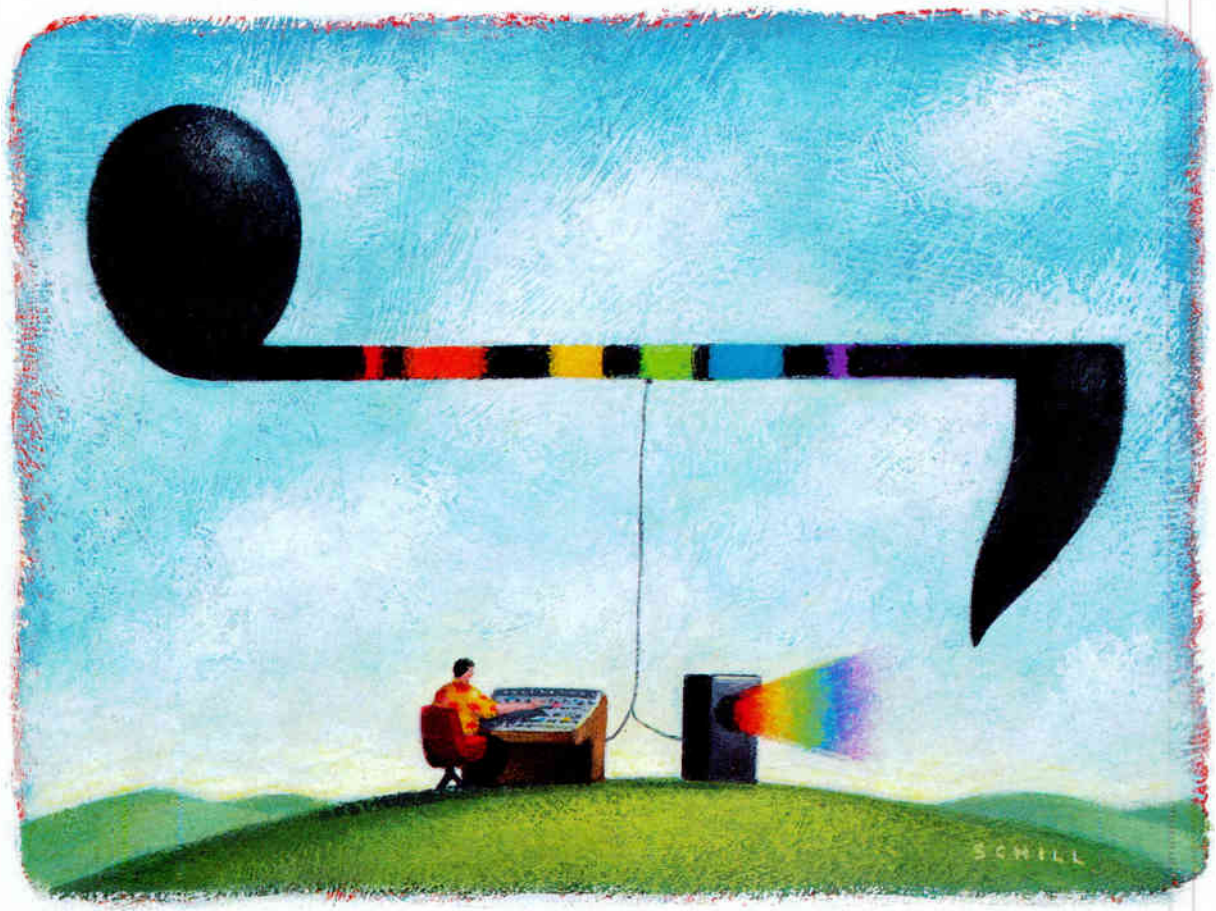

ILLUSTRATION: GEORGE SCHILL

Okay. Last month I asked you to hold on to my column so that you could give it the old once-over before you read this one. That time has come.

Good. I know you just looked it over and you are now ready to dive into this month's continuation with no further ado. So be it.

AND THEN THE LAWS OF PHYSICS WERE BROKEN

Certainly the advent of digital audio brought obvious advantages, but there's more. As digital signal processing is only math (big, touchy, ultraprecise math, but math just the same), it does not necessarily have to follow the laws of physics. In digital EQ, for example, there are no capacitors and resistors to phase-shift your selected audio frequencies, so there is no fundamental need to generate phase shift in order to equalize audio.

WELL-BROKEN, BUT THERE'S A CATCH OR TWO

Before I launch into the next part of the story, I would like to point out three important considerations. First, as I talk about digital audio, remember that we all *live* in an analog world—though some of us *work* in an alternate digital one. We must get our analog audio into, and back out of, that virtual digital world, and that A/D and D/A process has, guess what, both analog and digital filters that introduce audible signatures...more EQ!

Going from analog to digital and back does introduce some phase shift and even nonlinear frequency response, because of the same old stuff such as pre-emphasis, slew limitations and good old distortion and noise. Your conversion hardware must be chosen carefully, as it determines the best-case potential for your digital system and, therefore, all of your work. Today, this conversion enjoys the same mystical reverence and hatred that once was the sole domain of big multitrack analog decks. Most users don't really know exactly how or why one machine sounds like heaven and another like hell, but they know there are huge differences. So, choose carefully!

And now on to the second point. There is a horribly mistak-

BY STEPHEN ST.CROIX

PCI-324

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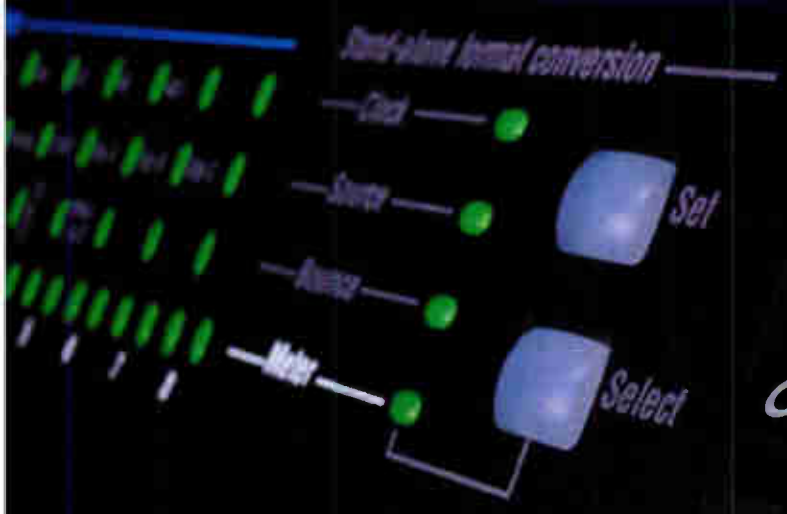

Why is the enhanced 2408mkII now even better?

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  The 2408mkII has quarter-inch TRS analog jacks (8 in / 8 out), with +4 or -10dB level inputs, so you can easily connect everything in your studio directly to your computer: synths, samplers, effects units — you can even plug in your guitar without an amp and use dozens of included 32-bit software plug-ins for fuzz, chorus, echos, and hundreds of other real-time effects.
- 24-bit converters.
  The 2408mkII's new 24-bit converters deliver incredible audio quality: 105dB S/N (A-weighted). Your audio will definitely be ready for prime-time.
- Front panel volume knob for the main outs.
  Connect your studio monitors directly to the 2408mkII main outputs, mix everything inside your computer — and there's still a volume knob for you to grab when the phone rings.

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- 24 simultaneous inputs/outputs expandable to 72.
  The 2408mkII has way more I/O than any other single-rack space system, and it's ready to expand as your needs grow with our entire line of affordable audio interfaces, including the new 24i with 24 analog inputs in 1 rack space.
- Tons of 24-bit ADAT optical and Tascam TDIF digital I/O.
  If you have an ADAT, Tascam tape deck, or digital mixer, the 2408mkII is by far your best choice for digital I/O with your computer.
- Sample-accurate sync.
  The 2408mkII has a wide range of professional synchronization features.
- Broad compatibility will all major audio software.
  Use your favorite Mac or PC audio software with your favorite plug-ins, or use the included AudioDesk workstation software, a complete virtual studio.

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en popular belief that once we do get our audio and ourselves into the digital domain, all is well. All processing will be noiseless and perfect, all transients preserved without degradation for all of time, no matter how many times our digital audio is copied or edited. Bull.

Digital audio has both a finite word length (think of it as total dynamic range) and DSP resolution, or more accurately, computational precision. Both of these factors effect noise and artifacts just like signal-to-noise and summing amp quality do in the old analog domain. And just as in our analog world, one *does* hear the differences in design between different digital systems! So if you are choosing a DAW, for example, pick one that does all of its EQ, crossfading and mixing live, in real-time during playback. This way you can make 1,000 changes to a tough section, and because none of the changes have to be done and undone for the next, absolutely no damage is done—no rounding errors, no truncation errors, no errors at all.

Let's say you have a 24-bit DAW with a 56-bit DSP. You add 6 dB at 3k to a snare. You like it. You go home. You come in the next day and hate it. You remove it. On a real-time, nondestructive system, there are no worries. You reverse the EQ, and all is exactly as it was before your misguided epiphany the night before. You still own a 24-bit snare track.

But on systems that don't have the horsepower to compute everything live during playback, this EQ change will be computed and permanently written over the original data. Now you have a 24-bit snare with a 6dB kick at 3k. Because there is a finite limit of 24 bits, where do you think that 6dB boost went? You can't add bits; it's still 24. You know the answer—everything was "moved down" to accommodate the boost. Yup, 6 dB of resolution may have been thrown out to make room for the new, hotter 3k boost, depending on the available headroom at the boosted frequency.

Now, when you change your mind and remove that +6 at 3k, you don't get back your lost 6 dB of data. You probably have changed that snare track from 24 bits to 23 bits for all of time. You have permanently cut the total dynamic range of the track *in half forever*! And this happens every single time you make a change. Smaller changes, less damage; larger changes, more damage. Ick. One answer to this dilemma? Don't buy a DAW that writes your edits, crossfades, EQs or even submixes (bounces). Just say no.

Ah, the third point. Believe it or not, early digital systems accomplished EQ using a simple analog model, IIR. This Infinite Impulse Response approach to EQ basically uses phase shift and cancellation to bend response curves, just like we thought we left behind when we ran from analog. It even introduces the same group delay errors and associated slurred impulse response. So why was this type of math used? Basically, because it doesn't use much computer power to do IIR EQ, they are simple and easy to implement, and there is minimal processing delay. But here is the kicker—most of today's digital hardware is *still* early digital and offers only this IIR EQ.

For the first time ever, it is now possible to equalize audio without *any* phase shift at all.

And there's more. If you do the EQ and un-EQ trick discussed under point two with IIR, you get another nasty surprise—EQ applied and written twice leaves twice the phase-shift artifacts behind! Nice, huh? Do an IIR EQ (writing over your old file), listen a few times and then un-EQ it (overwrite with the reverse EQ), do it again, un-EQ it, just as you might when trying to decide if you like it—each one adds more phase-shift garbage. The Undo trick does *not* remove the time domain errors; it actually adds more!

AND THE POINT OF ALL THESE POINTS?

So? Regular readers have probably realized by now that I have touched on some of these points before. But this time I wanted to push your awareness of how much EQ there is in our daily life, and to specifically describe one of the most powerful new EQ options that has ever come along, digital Finite Impulse Response EQ.

More and more comprehensive digital systems are beginning to offer both IIR (conventional time domain) and FIR (frequency-domain) digital equalization. To me, the real deal.

FIR EQ takes much more CPU power (and it costs more to provide the extra DSP) than the simple IIR and must be written very carefully to perform to its potential. Well, today's new personal computers have enough raw horsepower to easily run FIR EQs while running huge multitrack DAWs at the same time. And there are now companies offering DAWs, plug-ins or freestanding applications that *are* written properly.

FIR EQ is very different. For the first time ever, it is now possible to equalize audio without *any* phase shift at all. This means that, while we still have the old phase-crazed EQ that we know and love (or love to hate), we now have a new additional EQ—one that can take on any shape and amount that we can imagine, with absolutely no characteristic sound of its own. Theoretical EQ. EQ that boosts and cuts the frequencies of your choosing, as wide or as narrow as you desire, without changing the "sound" at all. Freaky. Misunderstood. Unbelievably powerful. And available right now. You could do no-phase-shift EQ with IIR in digital with this trick: Run the audio through the same digital IIR *twice*—once going forward, once going backward. You get "twice" the EQ, but the phase shifts cancel out perfectly.

Oh! We come to the real point of all this. As is often the case in life, you can't really tell what you have in front of you if you have never seen anything else. You can't really know what blue is until you have seen another color, just as you don't really have an understanding of blues until you have heard gospel, ska or *any* other type of music. One point of reference is next to useless. It takes that second one, and hopefully another and another, to truly understand even your first exposure. The truth is that you don't even know there is anything *to* understand until you have at least two points of reference.

And so it is with EQ. For our entire lives we have heard only one type of frequency-response alteration—time domain, or phase-shift EQ. This has always been how we have done it, the only way we have had to do it. All frequency-response alterations that take place in nature are accomplished in exactly the same way, acoustic delay and natural remixing of the delayed components with the original audio.

Until now, we have never seen regu-

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COMPANY PROFILE: Manley Laboratories, Inc. in recent years has expanded and thrived under EveAnna Manley's leadership. Our 11,000 sq. ft. building houses our own machine-shop, printed circuit board manufacture, audio transformer winding, engraving, and silk-screening facilities. All custom design, R&D, assembly, testing, and quality control processes are performed with precision and pride at the Manley factory, located just 35 miles east of Los Angeles.

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We believe that good music and those who create it deserve the finest gear.

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lar time-domain EQ for what it is, a profoundly audible special effect. We had never even wondered what EQ might sound like without phase shift. Why would we? EQ and phase shift used to be inseparable. In fact, for your entire life, every time you heard some heavyweight producer or engineer talk about why he likes or dislikes the *sound* of a particular EQ, or even says he can *hear* the EQ in the mix, he is really talking about the audio signature of the phase shift, the group delay errors, the transient damage—*not* the actual EQ!

And now we have FIR. EQ without the phase shift. EQ that boosts or cuts the frequencies of your choice without adding any sound of its own.

About now, those of you still awake should be wondering what this might actually *sound* like. Well, I'll answer that. It doesn't.

A GREAT TRICK TO TRY ON THAT POMPOUS COMPETITOR

Blindfold a trained golden ear and sit him in front of a good name-brand console in a good room. Let him learn the setup and acclimate a bit. Then roll a drum kit submix and dial in a boost of 6 dB at 500 Hz with a Q of, say, 2. Ask him what you did, and the chances are pretty good that he will say you boosted 500 Hz, 6 dB with a Q of 2. He will then probably ask why the hell you did such a lame thing. Tell him to hang on and you will show him why.

Now do exactly the same thing with a *good* FIR EQ—plus 6 dB at 500 Hz with a Q of 2. He will do anything from just sit there to twist and sweat as he tries to figure out what he is hearing, what he is *not* hearing, what just happened. As the chances are good that he has never heard boost without phase shift, he may cook as he tries to deal with the sensation of making certain frequencies louder without making them muddy or slurred. Remember, he has believed his whole life that he has been hearing the EQ, when in fact he has been primarily hearing the time disruption. What a great parlor trick.

If pushed, he may say that he thinks you boosted 500 Hz by one or two dB, but that it doesn't sound right. That pesky single frame of reference again: "right" being the only thing he has ever known, although it is in fact very wrong.

Now give him the boost knob, virtual or physical, and tell him to turn it up until he hears 6 dB of boost. Most engineers will turn it up to 10 or even 12 dB. Why? Because we love to. Because it takes so much more FIR boost to be audible. Because humans have absolutely no experience in identifying EQ without phase shift.

And what does all this have to do with your life? Simple. I want you to try FIR EQ. Not to replace your beloved IIR or analog stuff, but as an additional tool, a new tool that can actually do what you *thought* you were doing all along, EQ'ing.

WHAT I WOULD LIKE YOU TO DO FOR YOURSELF

I propose that you learn FIR EQ, become familiar with the power of doing EQ that your listeners *can't* hear. Use FIR EQ to fix problems that you have traditionally attacked in the analog domain. Beef up that kick or five-string bass the way you have always wanted to but wouldn't dream of because you knew it would all turn to mud. Add that kiss of intimacy to your vocal track without worrying about it becoming strident or brittle. De-ess by simply dropping a super-narrow notch on the offending band without the ringing or deadness you know you would get if you tried it with an analog or IIR EQ.

Fix lame synths without honking. Do precision surgery beyond your wildest dreams. Basically FIR EQ can be your Holy Grail—you can learn to use it to fix problems or add character, and nobody will ever be able to tell you did a thing. They will just think you are so damned good that it just got recorded that way.

Yeah, that's the ticket. Just like my own work…I *never* use FIR EQ. Never.

And your analog equalizers? Rethink them. Learn to use them for what they are, special effects. Use them specifically when you want them to be heard, when you actually want the EQ work to be noticed.

How bad can that be? Your whole life you have had only one type of EQ, and now you have two. The new technology does not replace the old; it augments it. Well, the old will probably augment the new after you have mastered FIR EQ.

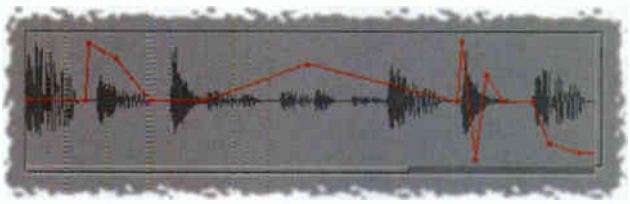
So go forth and multiply. And while you are at it, divide, add and accumulate a little as well. The frequency domain can be one of your new best friends. Go play. ■

SSC uses FIR EQ all the time. For every time he uses analog or IIR, he uses FIR 20 times. He plays a lot.

All Your Time-Stretching and Pitch-Shifting Dreams Have Just Come True...

A new version, more features, more power. This is not a toy.

Pitch 'n Time, originally released in December 1999 by Serato Audio Research, has already been described as the best pitch and tempo control tool on the market today. It has received rave reviews from a number of pro audio magazines and was recently nominated for the 2000 Mix Technical Excellence & Creativity award.



With the release of version 2.0, we at Imaginary Gadgets have built on that tradition of excellence to deliver a product which incorporates exactly what you have been wishing for.

Introduced in this release is an impressive array of new features including multi-channel mode, waveform overviews, tempo mapping, cue points and pitch mapping which together make Pitch 'n Time 2.0 an essential tool for your collection.

New in Version 2.0

Multi-Channel Mode allows you to process up to 48 tracks together while maintaining their orignal phase coherency.

Waveform Overviews mean that each of your graphical editing portals has its own preview. You can actually see the effects of your tempo map as it is applied directly to the Waveform.

Pitch Mapping allows you to create amazing pitch-bends and record-scratching effects by drawing your pitch change right on top of the waveform.

Tempo Mapping gives you the power to create variable tempo ramps and changes over the length of your sample.

Cue Points, this simple yet powerful feature lets you synchronize arbitrary cue points: simply move them where you want them to go in the output, and Pitch 'n Time warps the timebase as required!

Pitch 'n Time is powered by serato intelligent sound

Download your **free** 15-day trial of Pitch 'n Time

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Pitch 'n Time™ Version 2.0

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ILLUSTRATION: JAMES YANG

BY PAUL D. LEHRMAN

The first weekend of April, no joke, I got to take part in a concert in one of the great performing spaces on Earth, New York's Carnegie Hall. I wasn't exactly performing, but I wasn't exactly crew either. Nor was I exactly conducting: The American Composers Orchestra, a group devoted to presenting large-scale works of 20th (and soon, presumably, 21st) century composers, had chosen to present the New York premiere of the new version of George Antheil's *Ballet Mécanique*, which I had helped prepare for publisher G. Schirmer. Although I had done my best to make the piece playable by any ambitious performing group, the ACO still wanted my help. So I had the distinct pleasure of sitting on the stage and overseeing a computer, a bunch of mechanical pianos, and an ensemble of amazing musicians raise the roof in one of the loudest "classical" pieces those walls had ever contained.

Now, I know some of you are probably sick of me writing about this project (I talked about it in the March "Insider Audio," which is still available online at www.antheil.org, and also at great length in an upcoming article in *Electronic Musician*), and I have promised many people (like my editors) that I will soon shut up on the subject and get on with my life. But the story of what happened at Carnegie Hall is simply too good, and too relevant to *Mix* readers, to let pass. So indulge me one more time.

As you may recall, the piece calls for seven or eight percussionists, two pianists, four to 16 player pianos (in this concert, the parts were handled by eight Yamaha Disklaviers—which were plenty loud), seven bells, a siren and three airplane propellers. A computer running a MIDI sequencer controls the player pianos, and at the same time, triggers the sound effects, and also cues the conductor through a fiendishly complicated click track. At the school where I was teaching last fall, a student ensemble premiered the piece, and it was a

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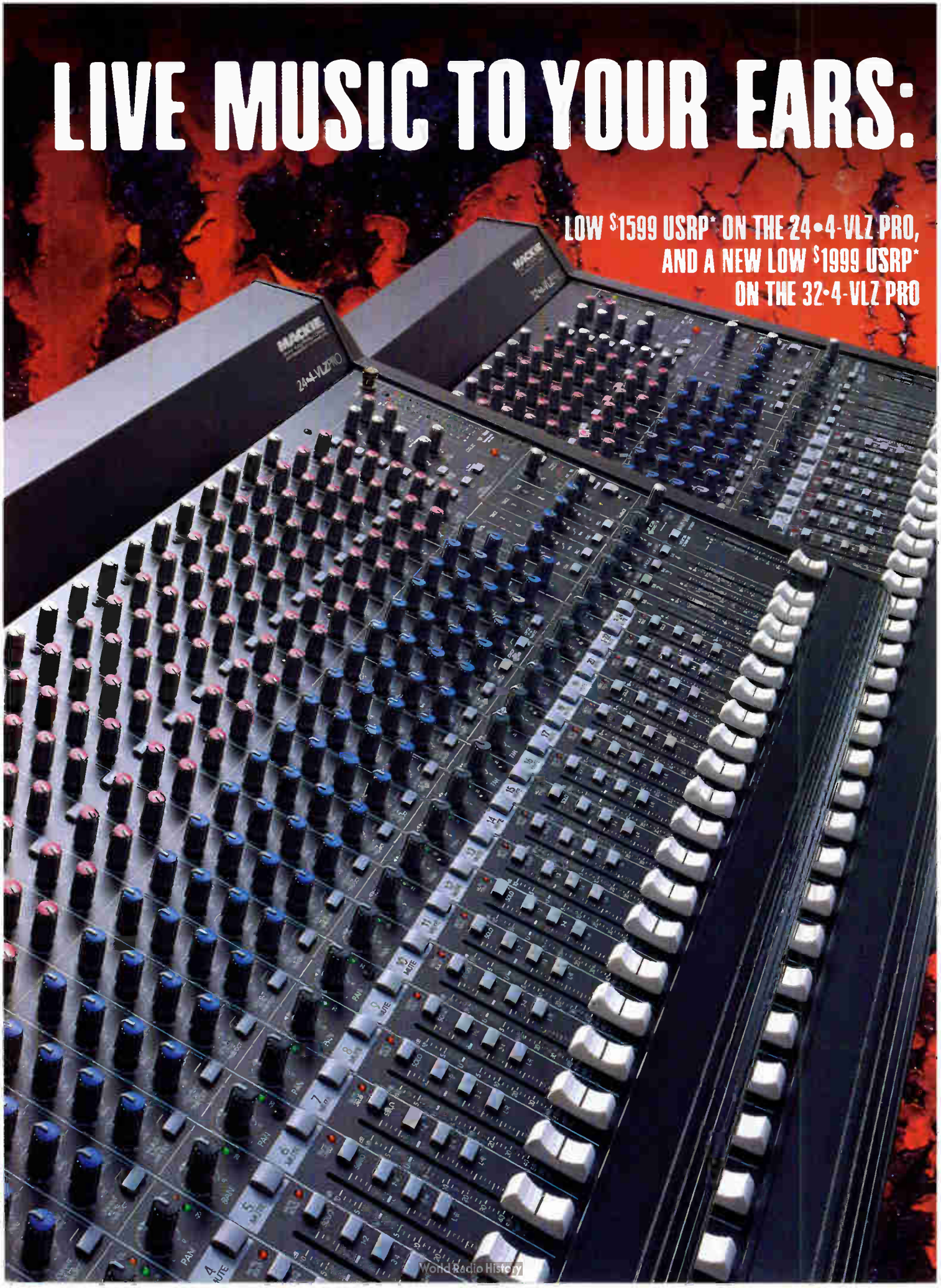

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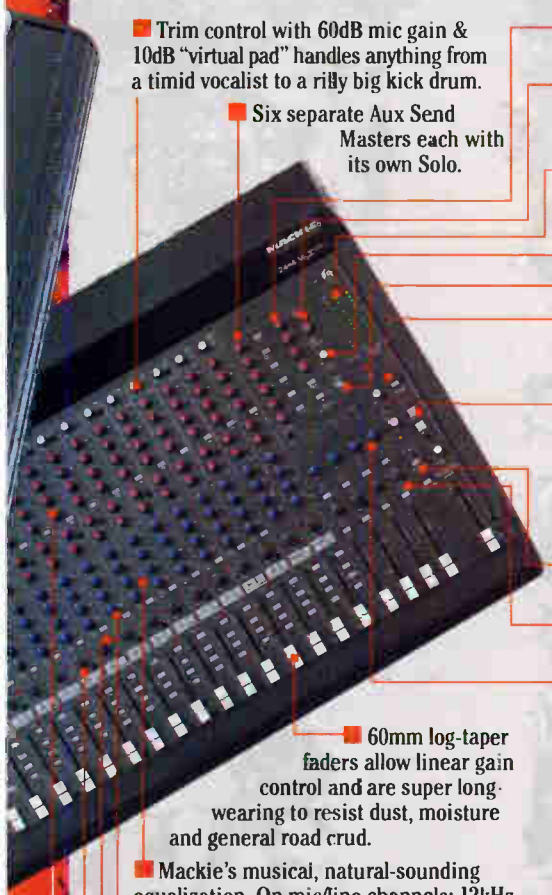

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tremendously exciting event. After that initial "shakedown" performance (and recording, which is now available on CD from the Electronic Music Foundation at www.cdemusic.org), the piece was ready to send out to the real world. The ACO was the first group to take up the challenge. The ensemble handled it beautifully—but letting my baby take its first steps, without me holding both its hands, turned out to have some interesting problems.

My job in New York was to supervise the MIDI and sound setups, answer any questions the conductor might have and sit on a preconcert panel discussing the piece. The orchestra hired Miles Green, a New York MIDI/audio expert who has worked with luminaries like Philip Glass and Laurie Anderson, to handle the hardware side of things. A couple of weeks before the performance, I sent Miles my sequence files (converted from Studio Vision Pro to MOTU Performer) and my samples (converted from SampleCell to the Kurzweil format), which he loaded into his Powerbook G3 and his K2000 rack unit. He hooked the computer up to a MOTU Micro Express XT USB interface and connected the interface to a bunch of synth modules.

Miles called immediately; there was trouble. The player-piano parts consist largely of huge, thick chords playing very fast, in precise rhythms. There are four parts, and in order to make them work at all, each part needs its own dedicated MIDI cable, or the note data would be way too thick—but this is no problem, one assumes, when you have a multiport interface.

But coming out of Miles' synths, the piano parts sounded alarmingly sloppy, and the click track was all over the place: sometimes early, sometimes late, sometimes disappearing entirely. It sounded as if he were trying to shove all of the parts down a single MIDI cable, and the dreaded MIDI choke was rearing its ugly head. The computer was certainly fast enough—heck, we had played the piece at school on a pokey, old 100MHz Macintosh 8100 with no problems at all, and in some rehearsals on an antique Quadra 650—so that wasn't the issue. USB is supposed to be a much faster protocol than Apple's ancient serial driver, so that shouldn't have caused any problems. So what the heck was going on?

A few frantic calls and e-mails to Mark of the Unicorn revealed the cause.

PHOTO: COURTESY OF YAMAHA

The American Composers Orchestra performing George Antheil's Ballet Mécanique.

Most multiport MIDI interfaces that communicate with the host computer at a speed faster than MIDI itself have a "throttle-back" feature. This is necessary when you want to send a long string of data to a single device, something that commonly happens when you are bulk-dumping a synth's program banks to the synth using MIDI system exclusive. If the data coming out of the interface is too fast, the synth's input buffer will overflow and the message may get garbled or lost. To prevent this, when the driver software controlling the interface detects this kind of rapid-fire MIDI stream, it throttles back the speed of the interface to the actual speed of MIDI, and sometimes even slower. In the case of the MOTU interfaces, my huge, lumbering piano chords were being misinterpreted as a sysex bulk dump, and the interface was deliberately slowing them down.

After about 30 seconds, Miles and I looked at each other: Where the hell were the propellers?

MOTU offered two solutions: We could use two interfaces, thereby lowering the data density through each and hopefully avoiding the throttle-back, or they could rewrite the drivers so that the throttle-back feature would kick in at a higher data rate. Miles opted for *both* solutions: MOTU sent him another interface and the updated drivers. There were no more problems.

But we weren't finished yet. A different kind of problem arose when I was told by the orchestra administration that the elaborate new sound system at Carnegie Hall was mono. Although none of the instruments need to be miked, the *Ballet Mécanique* does require a sound system with as many as seven individual speakers; the exact number depends on how many of the soundmakers in the piece are provided by a sampler and how many are played "live." The orchestra planned to use a live siren and bells, which left the three propeller sounds coming from Miles' Kurzweil. To keep the propellers from sounding like total mud, and to give them a proper stage perspective, the sounds needed to be physically isolated from each other; a mono system wasn't going to allow that.

Fortunately, in the March issue of *Mix*, there happened to be a great article by Mark Frink about this very subject: the new Meyer Sound system in Carnegie Hall. The article described the systems as consisting of two stacks on the sides, and an impressive cluster that was flown above center stage—and although it didn't say so specifically, it seemed obvious to me that, yes, the whole thing was mono. But the article revealed something else, which the orchestra hadn't told me: The hall also had a 6-channel monitor system, with six Meyer Sound wedges. Since we weren't going for huge SPLs on the propellers, three of the wedges, pointed at the audience, would seem to do the job admirably. I posed this question

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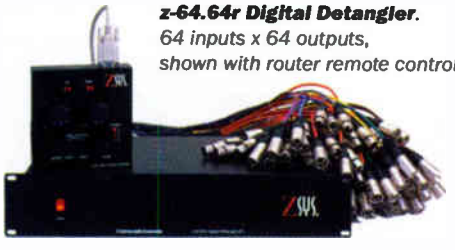

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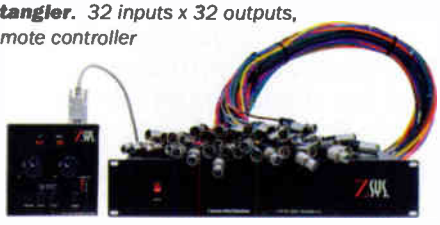

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to my New York colleagues, and their cautious reply was that if we could work it out with the hall sound crew, maybe we could use the monitors instead.

Now, I had been warned about this crew. Union crews in New York are notorious for being difficult to work with (Joke flying around the Javits Center whenever AES is in town: How many union guys does it take to screw in a light bulb? Ten! You gotta problem widdat?), and Carnegie Hall has a reputation in some circles for being one of the hardest venues of all. But when I arrived at the hall the morning of the performance (which was scheduled for 3 o'clock that afternoon), I found the absolute opposite to be true. The stage, sound and electrical crews were cooperative, knowledgeable, professional and eager to help with what they realized right away was going to be a fun gig. It didn't hurt that the sound crew are all avid *Mix* readers, especially when they realized that the piece I had just written about in my March column was the one that was about to be on their stage. And some are even Jean Shepherd fans.

It turned out my request that we use the monitor system had already been relayed to the crew, and so when we came in that morning, the wedges were already out and wired up. (Using the monitors also meant they wouldn't have to fly the center cluster, for which I imagine they were grateful.) It took us an amazingly short time to get everything in place and running. It simply couldn't have been handled better.

At the same time, the eight percussionists, two pianists, and the siren and bell players arrived and set up their hardware among the eight Disklaviers Yamaha supplied. A violist had been dragooned into the siren job, which she took on with great fervor—in concert, the sight of her formal black gown flying as she cranked furiously added immeasurably to the performance. A trombonist played the bells, which were connected to a MIDI-to-contact-closure converter, using an old Yamaha synth.

Miles and I set up our MIDI paraphernalia on a table onstage, next to the door leading backstage, that the crew had supplied. We were originally told by one of the orchestra managers that we should set up offstage, so the audience wouldn't see the "machinery,"

—CONTINUED ON PAGE 235

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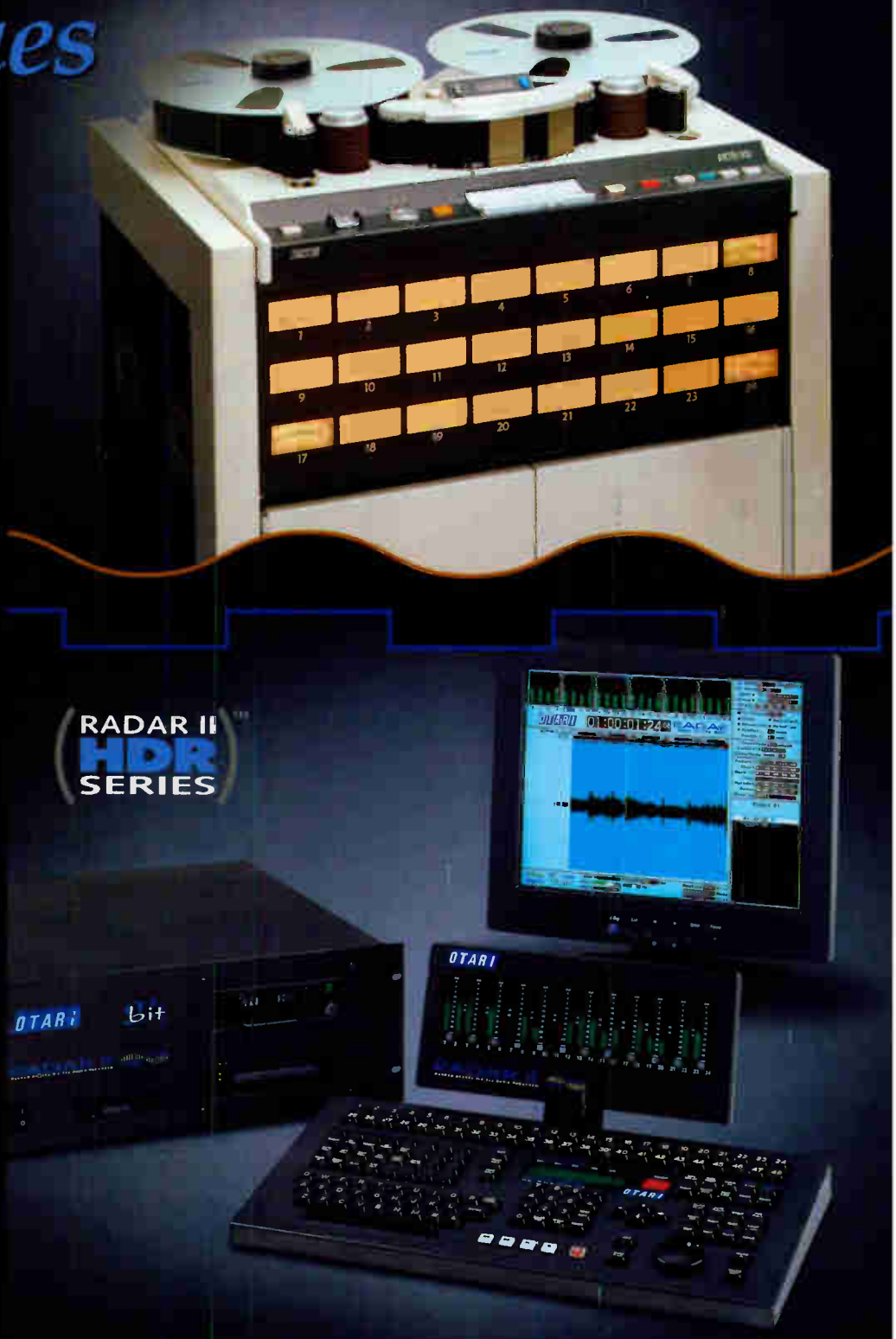

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STEVE MARCANTONIO

KEEPING IT REAL

Engineering country music is a special balancing act. Take a roomful of musicians, then double or maybe triple the guitars, add piano, stacks of keyboards, some strings, high-profile background vocals, a pedal steel, and perhaps even some electronic percussion. There's almost always a lot going on, but somehow you have to make it all sound simple. And, you still have to hear the bass and keep that all-important lead vocal way out front.

Steve Marcantonio is a master at the task. Given his trademark punchy drums, well-placed guitars and tastefully present lead vocals, it's no surprise that the client list of this former Jersey boy reads like a who's who of country. His work encompasses classic Nashville as well as the edgier side of the genre, including projects for Rodney Crowell, Deana Carter, Billy Falcon, the Nitty Gritty Dirt Band, George Strait, Alabama, the Warren Brothers and Vince Gill, among others.

It wasn't easy to catch up with Marcantonio. There are a lot of good studios in Nashville, and he seems to be spending time in most of them, juggling projects and producers. We finally caught up with Marcantonio on his cell and arranged to talk between mixes for Montgomery Gentry at Ocean Way Nashville and Deana Carter's latest at Sound Kitchen. It's a noteworthy comment on Marcantonio's personality and vibe that, even though our conversations were by phone, his enthusiasm and honest enjoyment of his work came clearly over the land lines.

So how does an Italian guy from Jersey end up as one of the busiest engineers in Nashville?

I grew up at New York Record Plant; I started there in '78. But really, it was pretty much a fluke the way I got started in the business. I come from a musical family, and one of my cousins, who lived with us, was in the Four Seasons. I used to go to a lot of concerts when I was a kid, and I always read the backs of album covers. So I knew about engineers, and I said, "I want to do that." Then, when I was a junior in high school, I took a course in record engineering. But during that course, I realized I was in way over my head. Everybody else in the class was already either a technical engineer or a musician. They were a lot older, and they were asking questions that I didn't know anything about; I just wanted to make music. I didn't play an instrument, but I listened to records and radio all the time. I would key in on certain instruments and just really get into their sound.

Anyway, I pretty much gave up on the idea of being an engineer after that class, although I kept on being into music. After high school, I went to work at the General Motors assembly plant.

God, that's so Jersey.

[Laughs] Yeah. Well, at the plant there was a time each year while they changed over to make the new models, and everybody got laid off for a few months. During that layoff time in '78, my cousin Joey happened to get on the phone with Roy Cicala, who owned the Record Plant. I'd read Roy's name on albums and I knew who he was. I guess that impressed Joey, because he said, "Let me see what I can do for you." Long story short, Roy took me under his wing, and I worked there until '84 when I became freelance.

Who did you work with at Record Plant?

Just the staff. But the staff at that time was like, Dave Thoener, Thom Panunzio, Jay Messina... Jimmy Iovine was still there then, and I got to do a couple of sessions

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with him and Shelly Yakus. It was a great time to be there. I didn't know a thing about recording when I started, but Roy wanted people like that because he liked to teach them his way. You came up through the ranks; you paid your dues—it was a great school. I was addicted to that place. I was there all the time; I slept there. I truly loved it. As tired as I was, every time that I went there I felt rejuvenated.

How did you move up to engineering?

I worked with Dave Thoener a bunch, and he really helped me out a lot. He was working with Rodney Crowell and he used to let me do overdubs for him.

One day I did an overdub for Rodney where I had to match a vocal sound. It was a bit difficult, but I did it, and he was really impressed. A year or two later, out of the blue, he called me up in New Jersey, to come down here [to Nashville] to work with Rosanne Cash, who he was married to at the time. So I came down to do a record, which was called *King's Record Shop*.

I did Rodney's record after that, with Tony Brown producing, and I started meeting people. Back then, it seemed like I was like the only person from New York around here. So I think I was looked at as having a different sort of attitude and a different sort of sound.

What was the difference?

When I first came here, they were doing things like recording drums direct. I'll never forget walking into Sound Stage Studios where they were recording Russ Kunkel and he was playing pads! That seemed so bizarre to me. They did it, I think, because the control room was not isolated from the studio. There was no wall, so, in order to record drums, you had to either listen on headphones or record direct.

But, overall, I think that at that time, in Nashville, the sound was a little bit more tame than it is now. And my sound, coming from New York, was a little bit rougher than what they were used to. I think, in general, my drums were a little louder, my guitars were a little louder, and there was more 'verb on the drums. People seemed to like it, and that's how I got started. Then I met Josh Leo, who'd moved here from California at around the same time. We're both Italian, and we hit it off immediately. I worked with him for about eight years. We did Alabama and a bunch of other stuff...and here I am.

Some people specialize in tracking or mixing, but you seem to do both equally.

[Laughs] Well, there are fewer acts now, and a lot more engineers, so it's a good thing I like to do both! I always love to mix, but tracking is sort of why I started engineering in the first place.

If you get it down really good on tape, then mixing is that much easier; that's my philosophy. When I track a record, if I know I'm going to mix it, I assume that what I'm hearing in my basic tracks is going to be the record—just maybe a bit more polished or fine-tuned. A lot of people have told me that my rough track mixes sound like records, and I take pride in that. It's the birth of the song right there in tracking, and that's really exciting for me.

If you know you're going to mix a record, do you prefer to cut the tracks?

Absolutely. Even the best tracks that you get, you always say, "I wish I could have done this or that." I just feel more comfortable with my tracks. I think most every engineer would probably feel the same way, don't you?

Can you describe your day today?

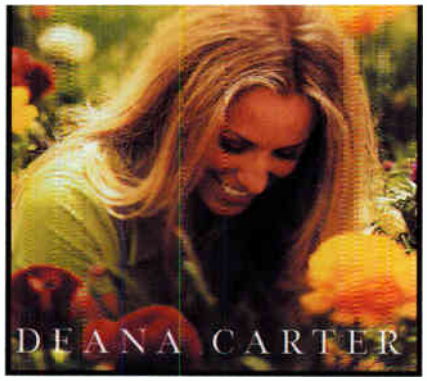
It's funny you ask that, because I just

came back from mixing in New York, and on my way to work today I was thinking about how good we have it here in Nashville. It's so easy to drive to this studio [Sound Kitchen]. It's easy to park; it's easy to get in and out. I live 10 minutes away from where I'm working today. This morning, I was reading the paper at home at quarter after 9, and I knew that the producer was getting in at about 10. I'd been thinking about a couple of changes to make in the mix, so I threw on my clothes and came over to do them before he got here.

I usually like to get a mix to a certain point at night and then close it out the next day. I don't see how these guys do two, three songs in a day. I'm kind of jealous of them, I guess, but for me, I like to spread it out a bit. I can't stay in the control room too long; I like to get up and walk around and stuff like that.

So, I had this mix up last night, and I was able to do a few things to it this morning before he got there. In like 10 or 15 minutes, I was able to do a dozen rides, and within an hour the mix was done.

When you listened to your ref CD at home, you made some notes about what things you'd like to change.



Right. I used to write stuff down, but now I usually don't. [Laughs] As bad as my memory is sometimes about other things, I can always remember that in the fourth bar of the first chorus I need to raise that one snare hit.

So that's what it was like today. I got up and went to the studio; I did my changes. I came home, I showered and I went back. By that time, my assistant had put down the multiple versions. I don't know what they do in California, but here we put down a lot of versions of the mixes.

You mean like vocal up, backgrounds up, bass up? Doesn't everybody do that? Well, certain guys I know don't. But here, you can do anywhere from six to 20 different versions. I stay to make sure it goes down right for the first master, but after that usually the second engineer will cover it because it's just a matter of running it onto tape. The second engineers down here are really good; they've got it together. That way you get about a two-hour break in between each mix.

What consoles do you prefer to work on? I go back and forth. When I came here to town I'd never worked on an SSL. But now that I've worked on SSLs, I like them a lot, especially the G Series. And I like Ultimation a lot. Which is good, because this is very much an SSL town.

On the other hand, I really love the [Neve] VR console. There's something about the VRs—to me, those consoles are more rock 'n' roll, and the bottom end sounds bigger. The SSL is a little bit more pop. Like I said, I go back and forth, because the SSL can sound more punchy. Just a little. It can sound like there's more attack on everything in general. I know it's kind of a vague statement to make, but that's the way I feel.

The 80-input VR at Ocean Way Nashville I totally love. I also like Trident 80Bs. And I'm excited about the new APIs. Sound Kitchen is putting in an 80-input inline Legacy; I know the sound of those consoles, and I'm sure it's going to sound great.

I love the old Neve [80-in 8078] at Ocean Way; it's one of the best sounding consoles I've ever worked on. When you lift up the fader to get a sound on something, it's almost as if you don't have to do anything to it. Old Neves can be like that. Sometimes your tracks sound better just running through them. I guess lately that's my console of choice. Also, since I do a lot of recording, I own a few API preamps. I also rent things. There's a cartage company down here called Underground Sound, which has a 12-input Neve sidecar that I use to record my drums through.

I hear you're a wizard on the Sony 3348.

I love the machine. There are some Studers around town, but I demand the Sony. It's just so much easier to use. I do a lot of flying, and I'm pretty quick at it.

To me the 3348 sounds great. And it's great on country records when you're recording eight or nine musicians, and you're gonna be using 30 tracks, and you're gonna be punching in—it's not uncommon that I'm punching in a whole band. I can rehearse the punch, then do auto-punch—you can't beat it. [Otari] RADARs are becoming popular here, and they sound pretty good, I must admit. They're easy to use. But I love the 48. You get great, punchy drums.

When you're recording, what mics do you like to use on them?

I use a lot of the same mics all the time on the drums. A Neumann 47 FET on the kick, and I might use an AKG D12 or D112 with that. I'll put the 47 outside and a D112 a little bit inside. I stay away from using gates. A lot of guys don't like any leakage on the kick, but I like the sound of the area around the kick drum, and I use the 47 to get a little of that air in there. I usually don't gate any drums in tracking. If I gate, I'll send it in a mult in mixing so I have an additional gated track to mix in.

With the snare, I go with a 57 in general, but it depends on what studio I'm at. I'll find out what kind of mics they have there. I've used 414s on the snare, and one time, the drummer brought in a Beta 57 that sounded great.

Do you mic top and bottom?

Yes, I do. When I first started doing the bottom, I got in trouble, because I had too much bottom—too much rattle. Now I tend to use just a little bit of the bottom or put it on another track.

On toms, I go back and forth. I've used 421s in the past, and at Ocean Way, they have Sennheiser 409s, which are great. Recently I bought these really tiny Sennheiser MD-504s and I've been using them. Even with those, though, I try to place the tom mics a little farther away, maybe 8 inches off the head, once again to get in a little of the air.

On hi-hat, usually a KM84. On cymbals, KM84s sometimes. Or 414s, 67s...I treat my overheads sort of like a stereo drum mix; there are a lot of cymbals in them. I try to get the sound of the drum kit in the overheads. Sometimes I'll start with those mics and build my drum sound from that.

Then, depending on where I'm working, I'll use some room mics—M49s or 67s. Over at Ocean Way, they've got RCA77s, the old ribbon mics; I like those for the room. And also I've used the Coles. At Sound Kitchen, they have four Audio-Technica mics wired into the ceiling that come up in the patchbay. They sound incredible, sort of like a nonlin-type room [setting]—a tight, short decay that's good for rock 'n' roll.

Sometimes I'll also put a center room mic down low, or sometimes I'll put a mic behind the drummer. I'll print them on separate tracks. If I have the tracks, I like to print three or even four tracks of room, to be able to blend them later.

You compress the room mics.

Definitely. I love the 1178s and the Fairchilds for that. If I can get hold of a nice set of Fairchilds, I'm happy. I also love using the Distressor on room mics. Actually, I'll use a Distressor on almost anything.

When you get to mixing, what's the first thing you do?

I'll listen to the overheads, blend stuff into them and try to get back what we had when we were tracking. Then what I'll usually do is run a submix of the drums through a Fairchild or an 1178 and bring that back on two faders to make it real punchy.

What settings would you be likely to use on compressors?

It depends on the song, the rhythm of the song. With the 1178, sometimes I'll press all the buttons in, and it does "infinity" or something like that; that can be really cool. Generally, I'll use the slowest attack and then a quick release, which gets them pumping. But it does depend on the tempo of the song. I'll mess with the attack mostly; the release I'll keep quick.

With the Fairchild, there's only one knob, and I usually tend to keep it on one, which I think is the quickest. If I use Distressors, I usually put them on Nuke or Opto.

What mics do you use on guitars?

I like 57s. Coles are cool, but sometimes they almost sound like the compressor is in already, giving a real attack-y kind of sound. Royers are good on guitars, and I also like using an 87 a little farther away, in conjunction with the close mics. A FET 47 also sounds great on electric guitar.

If I'm recording a straight-ahead guitar sound through an amp I'll either put an 1176 on it at four to one, with the attack about medium and the release on quick, or the Distressor at about six to one, or maybe the Fairchild. Sometimes on certain guitars, if you put the Fairchild on three, they'll sound really smooth. When I cut tracks, I usually run the acoustic guitar through a Fairchild. I like mixing it up and trying different things. If I go to a studio I've never worked at before, I'll ask the guys who work there what they have that's cool. Some guys don't like to do that, but I do.

What do you usually mix to?

I always mix to half-inch.

Do you prefer a Studer or an Ampex?

I use an [Ampex] ATR, although if there's a Studer available I'll use it. Sound Kitchen just purchased two of the older Studers—I don't know the model, with the scissors and the little speaker. I just did my first mix yesterday on one of

STEVE MARCANTONIO

SELECTED ENGINEERING CREDITS

Alabama: *Pass It Down* (1990), *American Pride* (1992)

Suzy Bogguss: *Give Me Some Wheels* (1996)

Deana Carter: *Did I Shave My Legs for This?* (1995)

Rosanne Cash: *King's Record Shop* (1988)

Mark Chestnutt: *Thank God for Believers* (1997)

Rodney Crowell: *Street Language* (1986); *Keys to the Highway* (1989); *Jewel of the South* (1995)

The Nitty Gritty Dirt Band: *Bang Bang Bang* (1998)

Randy Scruggs: *Crown of Jewels* (1998)

George Strait: *Lead On* (1994); *Carrying Your Love With Me* (1997)

Hank Williams Jr.: *Stormy* (1999)

Trisha Yearwood: *Where Your Road Leads* (1998)

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them, and it sounded great. I really prefer using half-inch when I mix, although I'll always run a DAT as a safety. And you never know—if the mastering engineer prefers to use the DAT tape, you will. But most of the time it's half-inch.

What kind of tape?

Quantegy 499, at plus-5 over 250. And I put some hefty level onto the tape.

Do you carry your own speakers around?

I have Genelec 1031As. Lately, I've been going back to NS-10s, too; I go through different speakers when I'm mixing. Like today, I have the big KRKs, I've got the Genelecs, and I've got NS-10s. The other thing I rely heavily on is my old Sony jam box.

How long have you had it?

It's 14 years old, and I must've put a few hundred dollars into it, just fixing it. It sounds great. There are many times during the day I'll have it on, in front of the console or somewhere behind me. It does wonders. I mean, you can't really judge a mix on it, because there's a lot of high-end stuff that sounds really loud on it.

But it's like the radio.

Yeah. We used to do that at the Record Plant. There was an engineer I worked with a lot, Bill Whitman, and he used to crank up his compressors and listen to it on a radio speaker. So I took that idea.

What else do you own?

When I first came here, everyone had their own gear, but back in New York no one owned anything. So I fought it for years, but now I finally have a rack. It's a low-tech kind of rack, though. I've got some TC gear—the M2000 and 3000. I like them because they have two engines. I've got this BSS dynamic EQ. And I bought an 1178. I love an 1178. I'd like to get a couple of 1176s too. Oh, I also own two Distressors. To me, they work similarly to almost every kind of limiter. A Distressor can be like an 1176, or, at times an LA2 or a dbx. I'll use them on everything—drums, vocals, bass. I've got some [API] 560s as well. And I've got a Space Station—I picked that up real cheap years ago.

Why do you think the engineer/manager thing, which is so ubiquitous in L.A., doesn't seem to exist in Nashville?

I think it's just smaller and more personal here. For example, Tony Brown is the president of MCA Records and he produces a lot of major acts. I can call him up tomorrow, and if he can't take my call then, he'll call me back in five minutes. You have personal relationships with everybody in town—the producers, the production assistants...It's more one-on-one in Nashville; it's more of a community. Here, I think, you go by your reputation and by word of mouth.

Do you have any theories on what makes a good-sounding record?

Well, I'm old school. When I listen to music on the radio, I try to picture the band actually playing. I listen a lot to oldies, and when you hear those records, you can almost see them in the studio. Nowadays, often you hear records and it sounds like, that guitar is "here" and something else is "over there"—it almost sounds like it's pasted. It doesn't sound real. I take pride in getting stuff on tape as good as possible, in just capturing the performance of the musicians without messing with it. And then, putting it out in its rawness. To me, that makes a good-sounding record. I don't care if there's a mistake or if you can hear a car going by outside. You need to fix some mistakes, but if it sounds natural and real, that's a good-sounding record. ■

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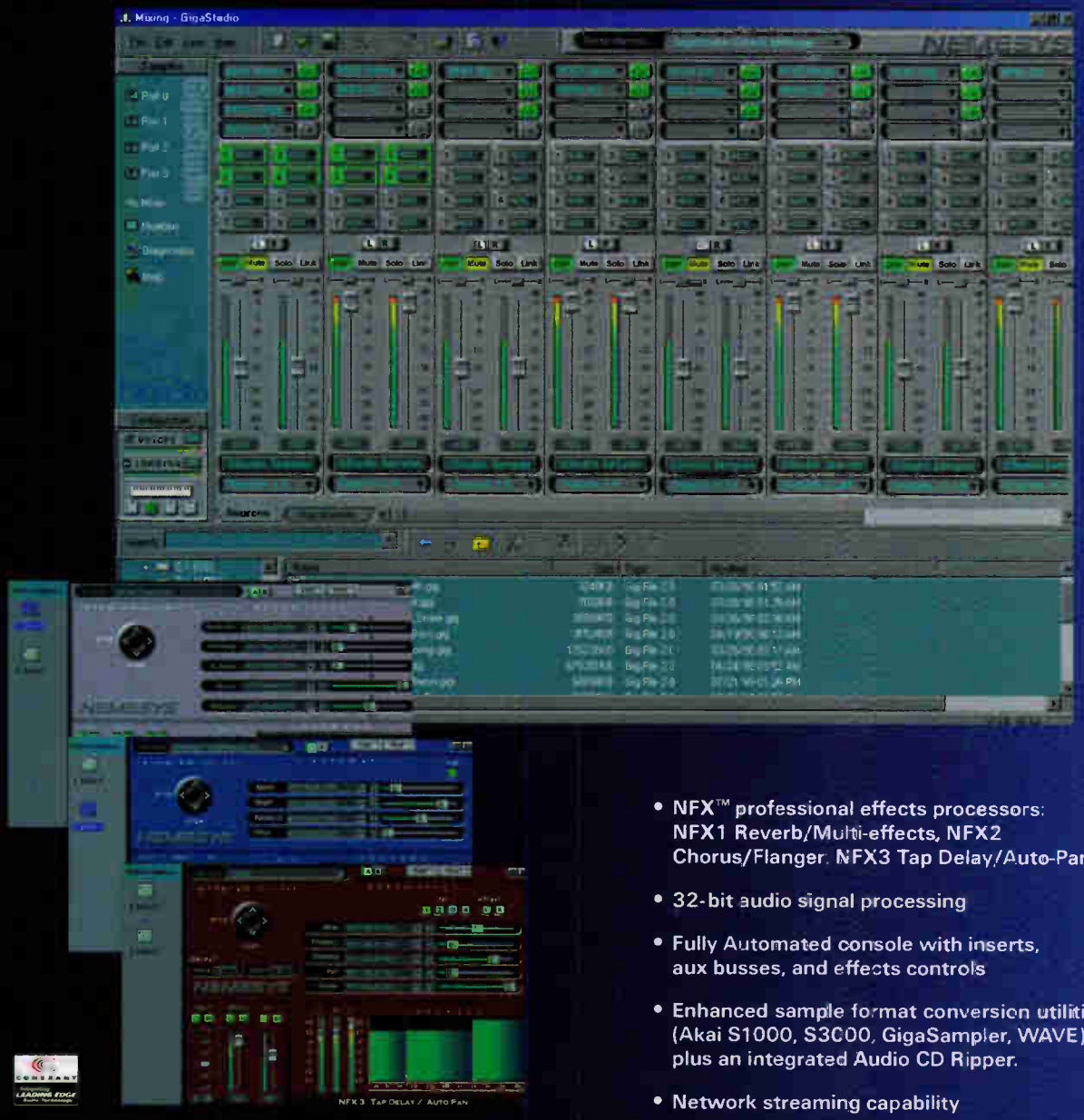

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As the price/performance ratio of recording gear continues to drop, owning a personal studio that's capable of pro-level work is a reality for more producers, engineers and artists. With that in mind, *Mix* sent three writers shopping and asked each of them to come back with an equipment list for an ideal personal studio. Our editorial assistant, Robert Hanson, had an imaginary $10,000 to spend, freelance contributor Randy Alberts was given a *faux* $25,000, and *Mix* technical consultant Roger Maycock could pretend to spend $50,000.

Now before readers scream about how their favorite piece of gear was left out of this hypothetical buying spree, bear in mind that the studios described here represent three possible templates for outfitting a room. And within these virtual studios, there is plenty of room for substitutions and for modification plans to suit *your* production needs. Along those lines, we made a few assumptions—such as most people already have a computer—so the purchase of a new PC or Mac wasn't included in the low-end budget. Additionally, items such as cabling, furniture, racks and acoustical materials—which are essential parts of any studio—aren't mentioned, as the focus here is on the gear.

ILLUSTRATION: KITTY MEEK

An obvious budget factor is gear you already own. In outfitting a studio, few of us start from scratch, and the 1915 Steinway B or rack of vintage tube processors gathering dust in your garage could be the centerpiece that turns your budget facility into a real gem. Also, for the most part, we've left out musical instruments; once you start throwing in the price tags for '58 Les Paul gold tops, '62 Fender Strats, some original Vox AC-30s and a 12-piece custom Drum Workshop kit, you'd be lucky to even have lunch money left.

Keep in mind, too, that though our writers went shopping for new equipment at retail prices, sources for used gear can be a real budget-stretcher. Great deals abound for the creative shopper, and sources such as trade magazine classifieds, local "Recycler"-type papers, trade-in stock at local dealers, "FS" listings on newsgroups and online auctions (i.e., Digibid, eBay) are all worth checking out, but the key phrase there is *caveat emptor*. Know your source and you'll sleep better when buying pre-owned equipment.

Finally, be aware that prices can fluctuate widely, particularly on lower-end M.I. gear where the competition is fiercest. At the higher end, discounts tend to be shallower, as retailers rarely use high-ticket gear as loss leaders. The bottom line is that the prices quoted in this article should be used as general guidelines, rather than absolutes.

Got those checkbooks/debit cards/credit cards ready? Let's shop!

THE $10,000 STUDIO

CANDLES AND AMBIENCE

When I imagine the perfect home studio, I see a dark—very dark—austere, macabre-themed room illuminated by a few candles and the reassuring glow of a computer monitor. I envision a recording environment where I can indulge all of my neo-industrial desires to track, tweak and mutilate whatever audio source strikes my fancy. I also predict a hefty bill from my interior decorator; I don't know if I'll find a cheap source for acoustical foam painted to look like splattered blood, but I'm sure that I can find enough ways to spend $10k on audio toys.

A LITTLE MORE VST THAN TDM

This is the "budget" dream studio; consequently, certain sacrifices have to be made. First, I'll have to forget a full-blown Pro Tools|24/TDM platform; with an entry-level system hovering around $8k, I'd hardly have enough cash left for cables and mics. So, for tracking and editing purposes, I've opted for Digidesign's Digi 001 system ($899). This is an excellent hybrid between plug-and-play ease of use and a system that actually does something. The package ships with Pro Tools LE, a stripped-down but still powerful version of its big brother, PCI card, and a breakout box, with a 2-channel mic/line pre, six line-level inputs, S/PDIF and ADAT I/O. For sequencing, arranging and the VST plug-in platform, I've also decided to pick up Cubase VST.

Everyone's gripe, myself included, is how awkward it is to dial up parameters or mix audio tracks with a mouse.

—Robert Hanson

Installing Pro Tools and a separate sequencer on the same machine is nothing new; however, the rationale behind my choice is a little different. Pro Tools offers a very reliable tracking medium (due in a large part to the integrated hardware), with world-renowned editing capability. Unfortunately, the RTAS plug-in platform that Pro Tools LE supports is a starter kit at best—although some big-name companies do have products in development. Steinberg's Cubase VST ($499) adds both a proven sequencing environment, as well as access to VST plug-ins and automation of VST instruments. To be honest, I'm really not interested in relearning to sequence with Pro Tools, and the ability to run VST instruments in tandem with Cubase is just too cool to ignore.

The host computer will be my modestly priced and equipped 400MHz G4 with 128 MB of memory, 10GB internal hard drive, 9GB Seagate Cheetah ($399) external hard drive for audio, SCSI port and a four-port USB hub. The Digi 001 system covers all of my bases audio-wise, but MIDI is still an issue. I love USB for one reason and one reason alone: 2x2 MIDI interfaces like the MIDIman MidiSport 2X2 ($169). Personally, I like to flesh out tracks on something as simple as a cheesy General MIDI synth and then go back and audition sounds off my higher-end units once I have an arrangement down and I can commit to audio. This previously required running two serial port interfaces (the cause of many headaches when I wanted to use the modem), but USB has made this practice a snap.

KILL THE MOUSE

Everyone's gripe, myself included, is how awkward it is to dial up parameters or mix audio tracks with a mouse. Thus, an external control device is a necessity. Unfortunately, it was difficult to find one box that would do it all, so I've opted for two. The first is CM Automation's MotorMix ($995) control surface (distributed by Digidesign); the second is Yamaha's 01V Digital Mixer ($1,699).

MotorMix not only offers control over any number of eight faders (volume and panning), but also provides expanded control over plug-in parameters, though only in Pro Tools. Furthermore, it's expandable; four MotorMix units can be linked, yielding 32 independent faders, and it also has automation, hence the name. The only mousing-about that has to be done with this setup is highlighting sections of audio, moving the cursor and pulling down menus.

What this system lacks is the ability to record anything elaborate or complex. Enter the Yamaha 01V, boasting not only fader automation and snapshot presets, but 12 XLR/line level inputs and ADAT I/O via the MY8AT expansion board. Now the sky's the limit; this will enable me to set up a full drum kit and record eight tracks (via ADAT) straight into Pro Tools, or I can just indulge in an elaborate amp-miking-voodoo exercise when the spirit moves me. Best of all, this setup provides both options and expansion possibilities.

BEATING A DIFFERENT DRUM WHILE DANCING

That brings up the issue of microphones. Just because I have the ability to mike a drum kit doesn't mean I'm going to do it anytime soon, and if such a project presents itself, a call to a local rental company or larger independent

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studio will take care of that. I need a couple of solid microphones that can handle vocals, guitars and beating everyday household items with a stick. For vocals and acoustic instruments, a Neumann U87 (about $3k list) is a bit out of my budget, but its newer sibling, the TLM103, offers a U87-derived capsule, similar performance and response, and fills the bill nicely at a third of the cost. For all the other odd miking situations that might arise, the Shure SM57 is a proven performer, and at $89 apiece, I can afford to pick up a few. SM57s are ideal for miking cabinets and monitors (one of favorite tricks for "livening up" sequenced drum tracks), and they can withstand some serious abuse.

TOYS AND MORE TOYS

For space purposes, I'm not going to delve into each of these items, but you gotta have some toys. I picked up Roland's Total Percussion ($699), the Alesis Nanosynth MIDI module ($299) and Alesis QS6 synthesizer ($699), with the optional "EuroDance" and "Classic Synths" Qcards—$199 each.

THE FINAL TOUCHES

All that's left to account for are monitors and a mixdown format. For my mains, I'm back on budget with the Event PS-5s ($499/pair), and while Randy Alberts wasn't looking, I snuck into his dream studio (this is starting to get weird) and nabbed his $370 Sennheiser RS-8 wireless headphones. I've stepped on more pairs of headphones than I care to mention, and if they're wireless, perhaps I won't take them off and leave them on the floor when I'm stringing stomp boxes together.

The final touch is a $699 Tascam CD-RW 5000 recorder. What I really like about CD-RW format is what originally attracted me to Mini Disc (yeah, I actually bought one—stop laughing); I can put down a dozen different mixes of the same song without burning a hole in my pocket for blank media; the Tascam unit will also write standard CD-Rs.

BACK TO REALITY

In researching this article, I spent only a *little* more time than usual surfing the Web, poring over catalogs and irritating the staff at the local Guitar Center. What really scares me is that over the next few months I'll be sacrificing every cent of disposable income to make as much of this a reality as possible...Wish me luck!

—Robert Hanson

THE $25,000 STUDIO

400 SQUARE FEET, TWO CPUs AND A LUNCHBOX

After years of sore tendons, arms and fingers from computer abuse, you'd think a dual-computer, software-based studio would be the last thing I'd want to buy with *Mix*'s $25,000 slush fund. However, given the power of the CPU, and my desire to work with audio and music creation tools in-house and in the field, I couldn't resist taking the plunge.

To fend off the physical effects of mousing around for a living, I paid close attention to ergonomics in putting this plan together for a friend's just-built CPU Studios in a Pacifica, Calif., home

> My first goal was to create a cross-platform environment with as many physical knobs, faders and dials as possible at arm's reach to save on body decay.
>
> —Randy Alberts

overlooking the ocean. My first goal was to create a cross-platform environment with as many physical knobs, faders and dials as possible at arm's reach to save on body decay. I also made it a priority to build a modular system that's as potent for remote recording and collaboration as it is for in-house capture and music creation. So, the two-computer idea was hatched.

TWO CPUs IN EVERY KITCHEN

With a goal of combining close-miked acoustic and rack-fed electric guitars with synthesis, sampling and as many plug-ins as possible, I drew up plans for a Mac tower and a PC-based portable. Because I already own a number of Mac and PC plug-ins, I opted to use my G4 Minitower as the main studio computer and my friend's BSI Computer LCD-V8 portable PC as the remote module. The latter is a "lunchbox" Pentium III running at 700 MHz that holds six PCI cards—a powerful desktop PC that far outstrips any laptop in a rugged, portable case that technauts drool over. The QWERTY folds down from the front of the case to reveal a 13-inch LCD screen—tiny but good enough to use for monitoring a live performance or creating tracks on the road. An extra 21-inch monitor waits for the lunchbox when it's docked in the studio for longer, vision-critical sessions.

To feed my healthy plug-in habit, I created a cross-CPU approach to access as many as possible. Since I already use Steinberg Cubase VST/24 on both platforms and have a sizable VST and DirectX plug-in stable, I decided to use Cubase as the base application on both the Mac and PC stations and build from there. My original software choice for the main Mac was Pro Tools, particularly for access to TDM plug-ins, but its higher price tag combined with my need for a second computer made PT the first of many painful gear-cut decisions. Having access to all VST and DirectX plug-ins on both platforms means there's still plenty of sonic possibilities throughout the signal chain.

A LOADED LUNCHBOX

The BSI portable is fitted with 256MB RAM, CD-ROM drive, an 18GB fast SCSI internal drive, a second SCSI card, and a 36GB external drive ($600) largely dedicated to my large library of .WAV and .AIFF files and NemeSys' GigaSampler ($229). The latter is one of many music creation programs installed on the PC, as I wanted this to be a potent remote music creation station as well as a solid record, edit and mix device. In addition to Cubase VST/24 ($499), there's Sonic Foundry Acid Pro 3.0 ($259), Steinberg's Reason ($399), ReBirth ($109) and D-Pole Filter ($139), Native Instruments' Pro-Five VST plug-in ($199), Mixman Studio VST plug-in ($199), the Cycling '74 Pluggo suite ($74), Opcode Fusion Filter ($199), Arboretum Hyperprism ($229), TC Works Native Essentials for Windows ($147), and Waves MaxxBass ($300).

The portable PC's audio I/O is handled by the Ego-Sys Waveterminal 2496 PCI card ($429), which sports 4x4 analog S/PDIF I/O, although I didn't find a way to make direct digital audio transfers from a PC to a Mac. Any ideas? Recording at 24-bit on the PC and routing the audio through a digital mixer to the Mac should be plenty clean. I wanted to avoid hauling a clunky breakout box around, yet I needed digital I/O and as robust an analog I/O cable

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breakout bundle as I could find. I liked the Waveterminal's 24-bit/96kHz support, 32-bit internal resolution, and perfectly suited ASIO, VST, DirectSound and GigaSampler audio drivers for what else is on the PC. To relieve mouse-born tendonitis, I added CM Automation's MotorMix ($995), a physical control surface with a small footprint and motorized 100mm faders, assignable rotary pods and mute/solo buttons.

For triggering Acid loops, GigaSampler samples, and the software synths, I needed just a simple 1x1 MIDI I/O and a small portable MIDI controller keyboard—MOTU's PC MIDI Flyer ($67) and Roland's PC 200mkII 49-note MIDI controller ($219), respectively. I could bring the Roland master controller mentioned below on the road, but it's bulkier to carry around, and the mini-Roland fits just right.

SUPERCOMPUTE THIS

The main Mac recording station is the 500MHz G4 Minitower with 256MB RAM, DVD-ROM drive, 10GB internal drive, a SCSI adpater card, and a 7,200 rpm LaCie 18GB external SCSI drive ($619). I liked the CM Automation MotorMix so much on the PC that I bought another one for the G4 ($995). Digital and analog audio I/O is handled by MOTU's Audio 2408mkII interface ($995), and MIDI I/O is handled by its MIDIExpress XT USB interface ($319). Tascam's CD-RW 2000 recorder/rewriter ($1,125) is the final output device, a powerful stand-alone that's also portable.

I found a great bundle that includes the BIAS Peak 2.0 editor and Toast CD-burning software ($299) for mastering, and I've invested a fair amount of the booty into dynamics, effects and editing software, as well. Onboard the G4 with Cubase VST/24 ($499) is Peak, Waves Native Gold Bundle ($1,250), Antares AutoTune ($289) for pitch correction, Steinberg Loudness Maximizer ($399), TC Works Native Reverb for Mac ($549), and finally, just as on the lunchbox, Waves MaxxBass ($300).

IN THE PILOT'S SEAT

Positioned with plenty of room to get to the connections in back, the centerpiece of CPU Studios is a rack/synth/computer cockpit workstation that wraps the computers, monitors and MotorMix surfaces, all guitar/mic and synth I/O and control surfaces, a racked Roland VM-3100Pro V-Mixing Station with TDIF-ADAT card ($1,400), and a Roland A-33 76-note controller keyboard ($469) front center, all within arm's reach from the comfy chair.

Partially sunk into the desktop and facing up at perfect 45° angles are two 16-space racks to either side of the desk. To the right I can easily reach the synth rack, the left grabbing the guitar and microphone I/O rack. Everything feeds into the Roland digital mixer that sits just under the computer monitor shelf, perfectly tilted forward just behind the master keyboard. More than 60 empty rackspaces bristle out the workstation's backside to fuel future studio daydreaming.

RACK ME UP

Though software synths and samplers are integral to this rig, the real synth rack and its numerous knobs totally rule. Check it out: Nord Lead2 Rack ($999), Novation Supernova II R ($1,795), Access Virus B ($1,250), and a Samson PL 1602 rack mixer ($189) to submix 'em all to the digital mixer. Not including the Samson, that makes 219 real knobs and buttons in a 14-unit rack—but who's counting? Gear-geeking aside, the ergonomics couldn't be better.

The guitar/mic I/O rack to the left houses a Drawmer MX-60 Front-End One ($579) to preamp, gate, compress, EQ and tube-saturate two Alesis AM-61 mics ($1,940 with shock-mounts and two mic booms) and a Fishman Acoustic Matrix NT1 pickup ($125) for my 1960 Gibson J-35 acoustic. A couple of Line 6 POD Pro's ($1,200) handle the electric guitar I/O, and another Samson mixer ($189) rounds out this juicy rack. I opted to leave out hardware guitar effects processors in favor of spending more dough on plug-ins, though the PODs sport a decent effects palette.

Finally, CPU Studios includes an Event Electronics Tria Triamplified Workstation Monitor ($999), a perfect three-piece, 320W companion to Waves' MaxxBass plug-in that subwoofs down to 35 Hz, and some comfy Sennheiser RS-8 wireless headphones ($370) for overnight sessions. That comes to a final budget of $24,993 for CPU Studios; I'll use the extra $7 for a movie to get me out of the house.

GREAT...NOW WHAT?

I had a blast spending *Mix*'s money in designing this modular capture and music creation studio. It's not as easy as it sounds to make budget, but doing so has inspired my friend and me to refine our actual project studios. The only problem now is I've filled my imaginary shopping cart at online retailers and local music stores enough to see my current setup needs serious funding—anyone have an extra $25,000 burning a hole in their pocket? —*Randy Alberts*

THE $50,000 STUDIO

MULTIMEDIA AND BEYOND

Pretend you are the winner of the (virtual) $50,000 Dream Studio Contest. The studio that has been thoughtfully created for you is designed for production of songs, jingles for radio and TV, but it was planned with the idea of expanding into sound-for-picture and multimedia content such as games. Also, since this studio is just a figment of your imagination anyway, I decided that you already own a MIDI keyboard, sequencing software, a personal computer, and the necessary interface to tie these items together.

THE CORE INGREDIENTS

The focal point of any recording studio is the console, and your dream studio will revolve around the Mackie Digital 8•Bus mixer. You can keep track of 72 channels of audio, and the system can drive full-color monitors via a built-in SVGA video port. A PC-compatible keyboard and PS/2 mouse can be added for further system control. You'll need three DIO8 TDIF/ADAT interfaces to connect to your multitrack recorder. MSRP: $9,995 for the d8b and $1,185 ($395 each) for three DIO8 interfaces. Assuming you don't already have a video monitor, plan on spending $300 plus another $40 for a basic QWERTY keyboard and $25 for a mouse.

Our multitrack recorder is the Tascam MX-2424. The MX-2424 is a 24-bit, 24-track hard disk recorder with a 24-bit/96kHz 12-track mode. It also includes "bonus" control software for the Mac, and Windows 95, 98 and NT. To connect to the Mackie d8b, you need the IF-TD24 TDIF interface, and for backup, you'll want the Travan TRD-NS20 Tape Drive. MSRP: MX-2424, $3,999. IF-TD24 interface, $499. Travan tape drive, $545.

For delivery of mix stems or surround mixes, many facilities and production companies require the Tascam DTRS for-

mat. We selected the Tascam DA-78HR digital multitrack recorder, supporting 24-bit audio data while retaining backward compatibility with existing 16-bit DTRS machines. MSRP: $3,299.

The master recorder for this system is the $1,699 Alesis MasterLink ML-9600, a combination hard drive/CD-R recorder with the ability to record/edit up to 24-bit/96kHz digital audio direct to its hard disk and burn this data to inexpensive CD-R blanks using a proprietary format known as CD24. CD24 data is written to disk as .AIFF files and can be read by standard CD-ROM drives, making its 24-bit files accessible to virtually any mastering facility, even if they don't own a unit. MasterLink can also write standard Red Book CDs for compatibility with consumer CD players. MSRP: $1,699.

The dream studio's video facilities include the Panasonic AG-DS555 S-VHS/VHS video. The machine has four audio channels (two stereo Hi-Fi, two linear with Dolby NR) and built-in SMPTE generator/reader with dedicated timecode I/O. MSRP: $4,000. The video monitor is the Sony KV24FV10 Wega 24-inch flat screen Trinitron monitor. MSRP: $599.

You'll need a synchronizer to lock the entire setup. I bought the TimeLine MicroLynx and the optional $200 VSG PAL/NTSC video sync generator card. The MicroLynx carries a MSRP of $2,995.

MONITORING YOUR WORK

For surround and 2-channel monitoring, our dream system includes five Hafler TRM6 powered, mag-shielded reference monitors ($625 each) and the accompanying $695 TRM10S subwoofer.

To check boombox mixes, two Fostex 6301BEAV reference monitors ($229 each) combine an integrated 10-watt amp and 4-inch full-range driver. Besides delivering a big sound, they're ideal where video production and multimedia work requires accurate playback that translates well to other small systems.

The AKG K-240 headphone is considered a studio essential. They're not new, but sound great and are trusted by professionals everywhere. MSRP for two pairs ($173 each) is $346.

MICROPHONES

Every studio needs at least one, high-quality, versatile microphone that can accommodate a variety of recording situations. Here are two excellent, yet considerably different microphones and my choice in high-quality mic preamps. The RØDE Classic II is a valve condenser mic that provides nine polar patterns ranging from omni to cardioid to figure-8. MSRP: $1,995. The Audio-Technica AT4050/CM5 multipattern capacitor microphone is a large-diaphragm condenser mic with three switchable polar patterns—omni, cardioid, and figure-8—and an outstanding reputation among recording pros. MSRP: $995.

Every studio needs at least one high-quality, versatile microphone that can accommodate a variety of recording situations.

—Roger Maycock

The $2,195 GML (George Massenburg Labs) 8302 all-discrete-transistor, Class-A, transformerless 2-channel mic pre is a hand-built unit that requires a $475 external power supply.

SIGNAL PROCESSING

The Roland VP-9000 VariPhrase Processor is capable of real-time manipulation of a sampled phrases' pitch, time and formant via MIDI without inducing audible artifacts. VariPhrase technology enables the VP-9000 to instantly match loops from different sources to the same key and tempo, bend notes in real time without changing the phrase length, and modify the duration of notes held within a phrase. MSRP: $3,295.

Considered primarily for its lush reverbs, the Lexicon PCM 81 features 24-bit internal processing, a true stereo signal path, balanced analog I/O, full AES/EBU and S/PDIF digital I/O. At $2,995, it's an invaluable component in the dream studio.

The TC Electronic FireworX features an 8x8 position routing grid. You assemble your multi-effects chains by placing the algorithms anywhere on the grid, at which point, they will be automatically "wired" together. Effects include Vocoder, Ring Modulation, Synth Generator, Formant Filter, Resonance Filter, Multitap Delay, Reverse Delay, Dynamics, Fractal noise and others. MSRP: $2,195.

For compression and equalization, the Avalon VT-747SP combines a stereo tube-discrete Class-A spectral-opto-compressor with a 6-band program equalizer, L-R output level and gain reduction metering and internal regulated power supplies. This unit is ideal for high-performance input signal conditioning, stereo bus compression-EQ, and analog mastering applications. MSRP: $2,495.

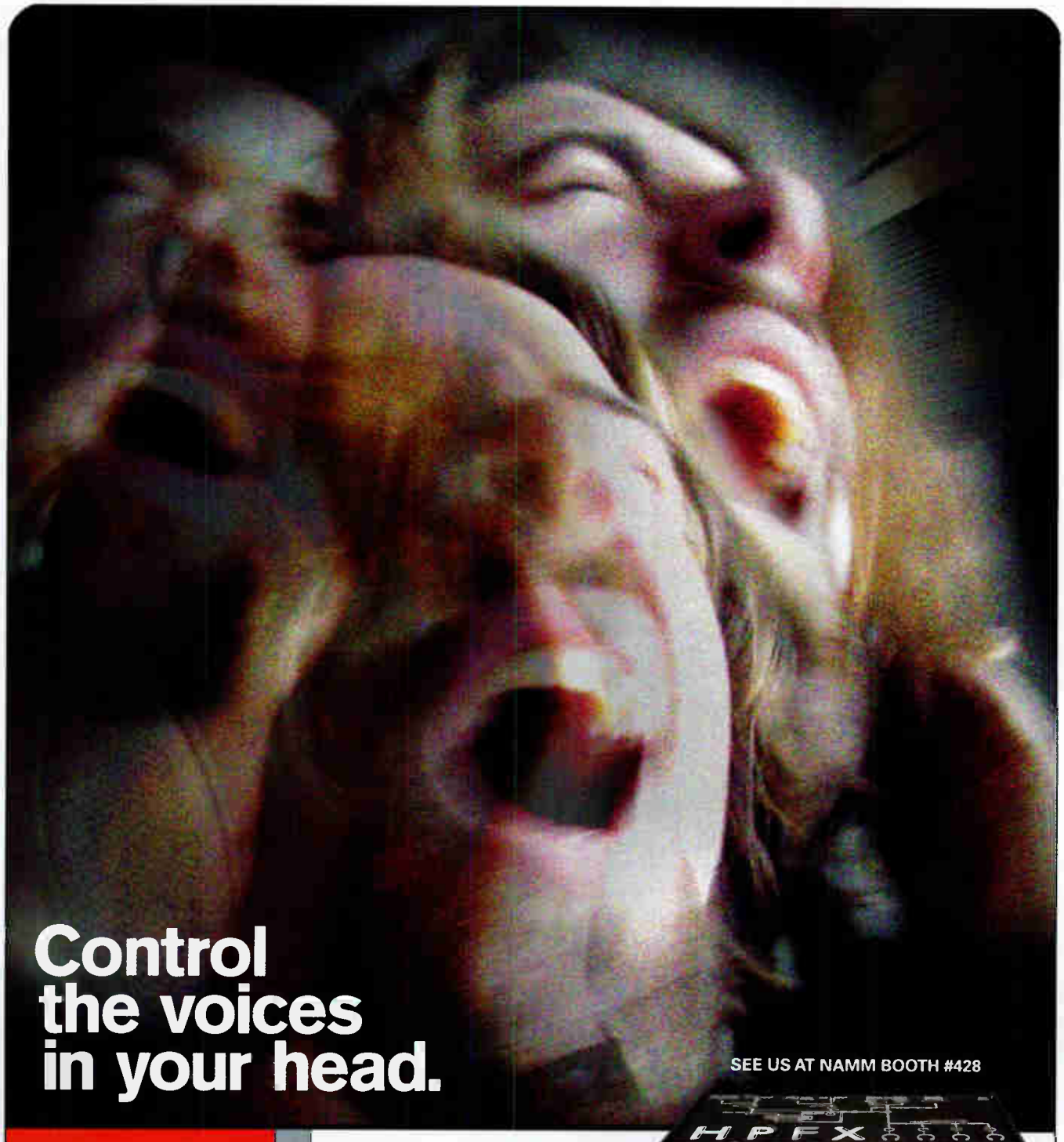
A FEW ALTERNATIVES

Here are some alternatives to the items listed above. The Mackie HDR24/96 hard disk recorder has many features similar in nature to the Tascam MX-2424. In lieu of an integrated HD/CD-R mastering deck like the Alesis MasterLink, you may prefer separate components—in which case, you could consider the Tascam DA-45HR DAT recorder and the Yamaha CDR1000 CD burner. The CDR1000, in particular, is an outstanding model incorporating Apogee UV22 word-length reduction technology.

Speakers are a very personal item, and thus you may wish to audition models such as Event Electronics' PS-Series or 20/20/bas monitors. Further, JBL Professional's Linear Spatial Reference Studio Monitor series, including the LSR25P and LSR28P, make another excellent choice. One interesting speaker selection that caught me totally off-guard for small systems playback was the recommendation of (dare I say it) Radio Shack's Optimus Pro-X88AV. Yes, you read it here! Radio Shack's speakers were recommended by several knowledgeable pros.

DOING THE MATH

In case you haven't yet pressed your calculator into service, the actual sum total for this dream studio is $50,644. I'm over the limit, but remember, the quoted prices are retail. If I shop carefully, I should be able to acquire every item and still have a budget for cables and other accessories to help interconnect the entire system. There are some truly wonderful products in this system and not all of them brand-new, which serves to reinforce the point that the best gear tends to hang around for a while. *—Roger Maycock* ■



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RIDING THE I/O EXPRESS

A BUYER'S GUIDE TO DIGITAL AUDIO CARDS

BY RANDY ALBERTS • ILLUSTRATION BY DAVE EMBER

Like busy train stations, digital audio I/O cards today shuttle more incoming and outbound tracks than ever before. Whether you're riding the Toslink Overland, AES/EBU Bullet Train or Analog XLR Express, there's a wealth of new cards to choose from when routing tracks into and out of any laptop- or minitower-based station.

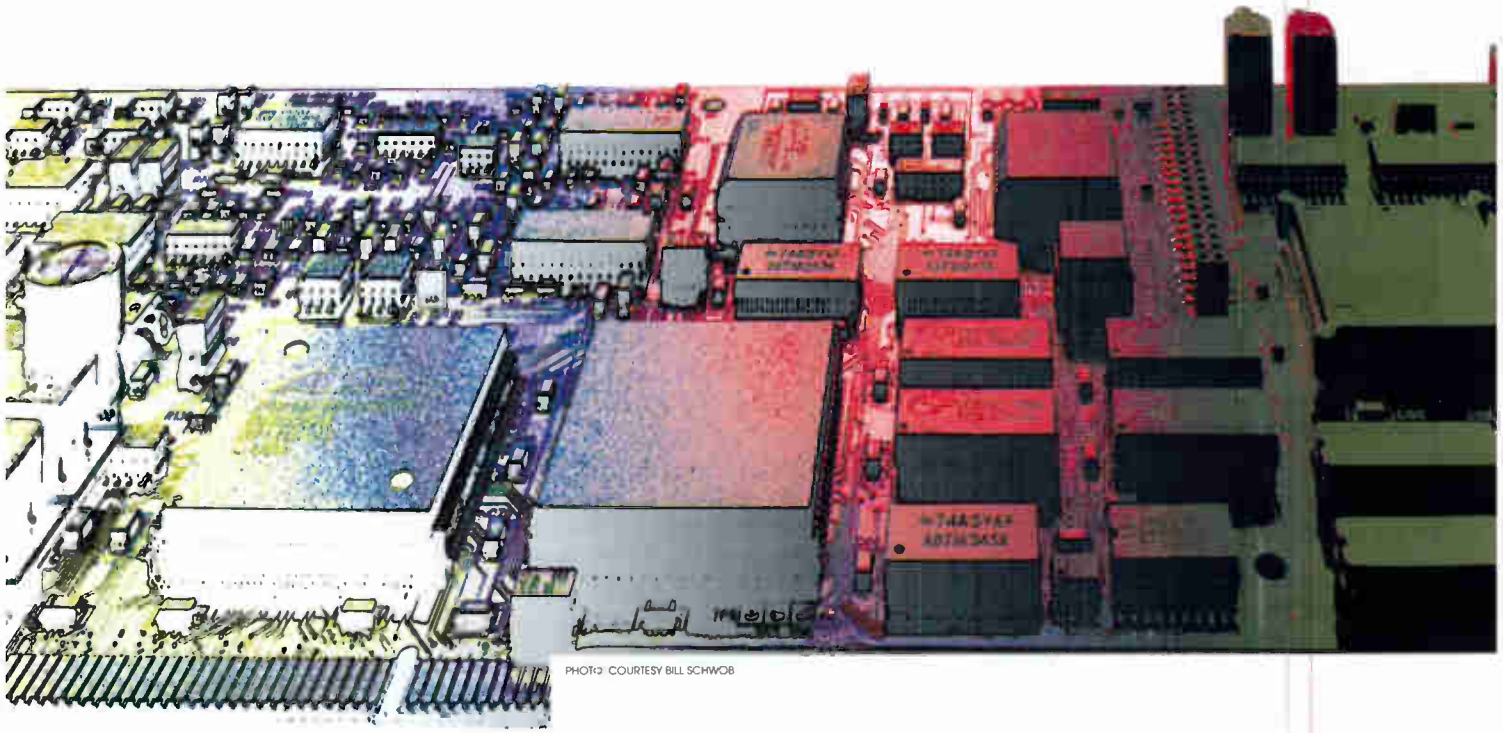


PHOTO COURTESY BILL SCHWOB

A BUYER'S GUIDE TO DIGITAL AUDIO CARDS

If you're looking for a new I/O card, we know there are a lot of options out there, so to make it easier for you, we've put together the following list of new or significantly upgraded I/O card packages released since Winter NAMM '99. Information on bundled software, hardware and connectors is included, as is data about analog and digital I/O, sampling rate support, synchronization, driver updates, onboard synthesis, DSP effects, expansion options and more.

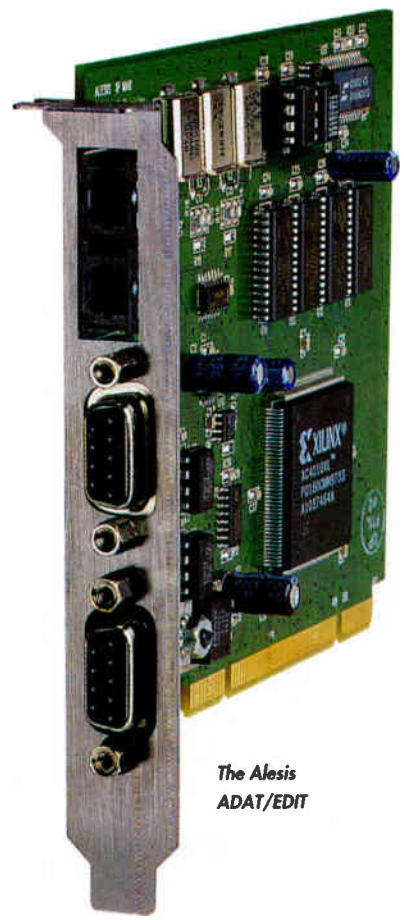
A few turnkey computer solutions are included here, but the majority of these audio I/O solutions for Mac and PC consist of a PCI computer card; a breakout box or cable bundle; and a collection of mixer, sequencer and/or audio utility software applications. Look for cards with SMPTE and VITC support for film and video work, digital inputs and outputs for lossless audio transfers, and dedicated onboard DSP to help you design the widest and most efficient audio "train station" your computer can handle.

Aardvark's Aark 24 ($899) is a 24-bit solution for Windows 95/98 users. It offers eight ¼-inch analog, RCA and Toslink S/PDIF, ADAT optical and word clock I/O connectors. Aark Direct ($425) comes with virtual mixing software, 2x2 ¼-inch and RCA analog and S/PDIF I/O, and an optional AES/EBU interface, all in a single rackspace. Aardvark's Aark TDIF ($425) includes DSP processing, peak metering and eight channels of 24-bit TDIF audio. The Direct Pro 24/96 ($699) comes with a full complement of PC audio goodies: four XLR mic and four ¼-inch inputs, six line outs, RCA S/PDIF connectors, three-stage input trim, and DSP effects that include compression, reverb and EQ algorithms.

Users can now plug all their ADAT tracks directly into a Mac or PC with **Alesis**' ADAT/EDIT ($399) package. A PCI card, 3-meter ADAT optical cable and customized ADAT audio editing software are included, as are the ADAT/CONNECT audio transfer utility and .WAV, AIFF, ASIO and Sound Manager drivers.

Antex's StudioCard 2000 Plus ($895) is an improved 24-bit/96kHz version of its now-discontinued StudioCard 2000. It routes two channels of AES/EBU and S/PDIF digital audio in addition to the existing 4x4 analog I/O interface. Bundled with the Plus is Samplitude Project multitracking software from SEK'D; an optional breakout connector box is available for $200.

Among many new **Creamware** products launched at the recent Frankfurt MusikMesse show were three new I/O card solutions: Luna 2496 DSP ($998), Pulsar II ($1,398) and Scope/SP Studio Pack ($4,695). The Luna is an expandable cross-platform system with an 8-channel rackmounted breakout box and three Analog Devices SHARC DSP chips that can be upgraded to provide more than 100 channels of 24/96 audio I/O. The Pulsar II now boasts S/TDM bus support, ASIO and EASI drivers, and six SHARCs that boost DSP power 50% over the original Pulsar card. Picking up where its predecessor left off is the Scope Studio Pack, a complete recording, synthesis, sampling, effects, mixing and mastering solution for Windows and Mac OS, with 15 SHARC chips that do a lot more than just reduce host CPU load.



The Alesis ADAT/EDIT

Digidesign has released enough I/O options to satisfy any PC- or Mac-based audionaut. The flagship Pro Tools|24 MIXplus System (starting at $9,995), Digi ToolBox XP ($545) and 1622 I/O ($1,595) all debuted since Winter NAMM '99, and the new 888/24 I/O Audio Interface ($3,695) and Digi 001 ($995) have been big releases, as well. The 888/24 provides eight channels of 24-bit analog and AES/EBU and S/PDIF digital I/O, supports Mac and Windows, and can operate as a stand-alone ADA converter. The entry-level Digi 001 system is plenty powerful, featuring eight analog inputs (two with built-in mic preamps), ADAT optical and coaxial S/PDIF digital I/O, separate monitor and headphone outputs, and it comes bundled with Pro Tools LE and a good collection of DigiRack plug-ins (AudioSuite and RTAS plug-in formats are also supported).

Until **Digigram** released its first professional PCMCIA audio I/O card, the tiny ⅛-inch micro jack inputs and dearth of PCI slots on laptop computers kept most engineers from taking computer-based recording very seriously. The new VXpocket V.2 ($729) adds linear timecode (LTC) SMPTE support and two balanced mono mic/line inputs to the original VXpocket. Digigram's new VXpocket 440 ($1,069) goes up to 4x4 balanced XLR mic I/O configurable as four outputs, and the VX222 ($529) sports stereo XLR I/O. All three make professional 24-bit, multichannel, remote laptop recording a reality.

The TDIF 2496 ($495) and CardDeluxe ($595) were two new PC audio solutions released in the past year from **Digital Audio Labs**. TDIF 2496 Pro, with ASIO and AudioX drivers, supports up to 96kHz sampling rate and 24-bit audio over 16 simultaneous digital I/O channels. CardDeluxe features 24-bit audio over stereo S/PDIF digital and 2x2 ¼-inch analog connectors, includes Active Movie and DirectX plug-in support, and will have Mac CardD drivers in the near future.

Edirol, the exclusive North American distributor of Roland's computer division products, released two new PC digital I/O options during the past year. The ED U-8 USB Digital Studio ($795) packs a lot into its USB-fed hardware interface: Faders, pan and transport controls are grabably close, there's three assignable knobs, and users can plug unbalanced XLR mic or Hi-Z guitar into

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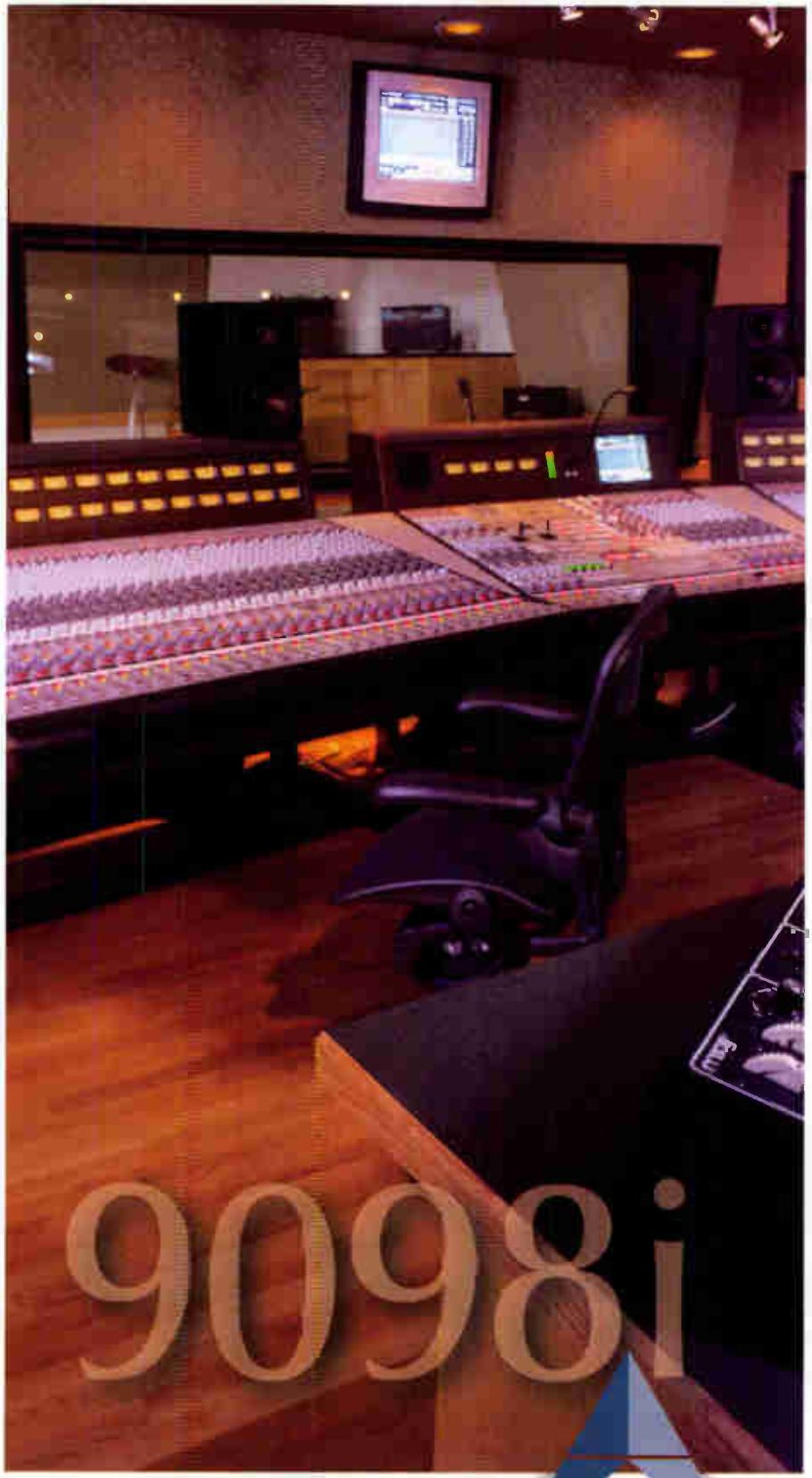
s a Producer/Engineer, I've spent years sitting at big ınsoles wondering what in the world they were thinking ıout when they designed this automation? With the 9098i, e automation is powerful, intuitive, and I don't have to get side some programmers head to make things work. ʰ yeah... It sounds amazing too."

ad Wood, Producer/Engineer

When only the best will do. When no ompromises are acceptable. When sonic erformance rules. These are some of the riteria in selecting a 9098i. Along with its onic integrity, the feature set is also qually impressive. Recall, dual moving ader automation, built in dynamics and ndisputable superior mic preamps and qualizers. The 9098i combines the best haracteristics of vintage consoles with eatures demanded in today's mix nvironment. We invite you to audition a 098i and experience the finest mixing onsole ever created.



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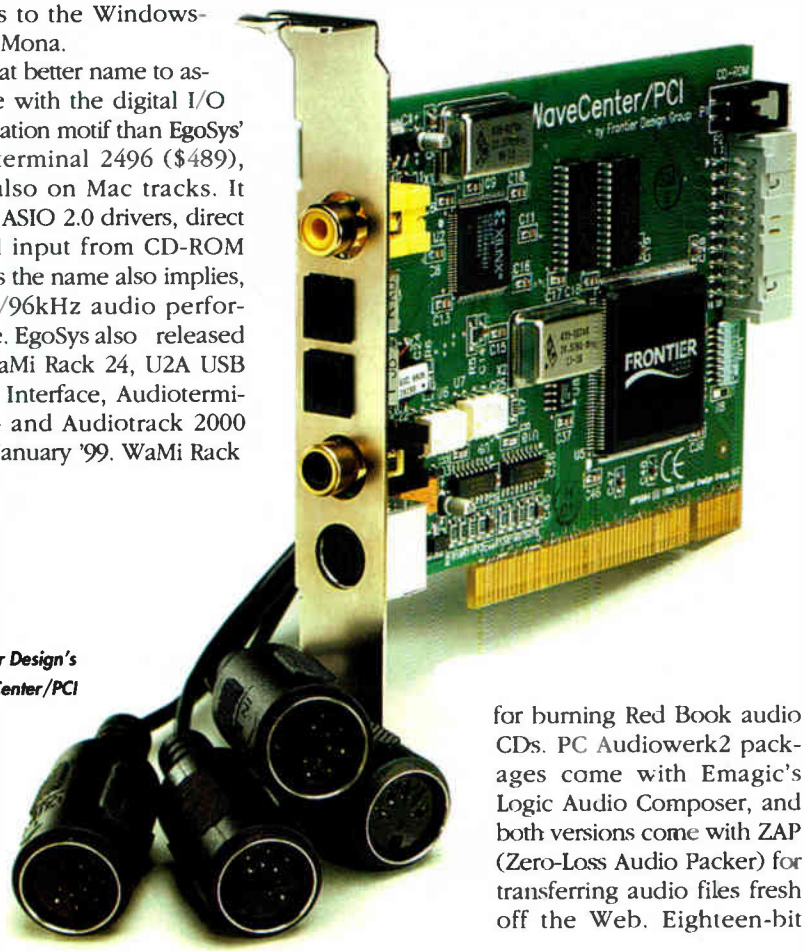
A BUYER'S GUIDE TO DIGITAL AUDIO CARDS

inputs on the front panel. Optical S/PDIF I/O and a powerful onboard DSP engine are included. Edirol's ED UA-30 Audio Interface ($325) for Windows now also does Mac (an OSX driver is due soon), and it's the only I/O solution for routing pro-level audio in and out of an Apple iBook.

One new and two updated I/O packages were added to Echo Digital Audio's family of I/O solutions. The new Mona ($995) sports 4x6 XLR and ¼-inch I/O jacks, +4 and -10 dB output levels, S/PDIF and ADAT optical digital, four mic preamps with phantom power, word clock support, and comes bundled with Syntrillium's Cool Edit Pro. Echo's Layla24 ($995) now adds 24-bit/96kHz support and an improved 115dB dynamic range to a feature set that includes eight balanced +4dB TRS analog and stereo S/PDIF and ADAT digital I/O, MIDI in/out/thru, and Esync for interfacing with other Echo 24-bit cards. Similarly, Gina24 ($495) adds 24/96 audio support to this PCI card/ breakout box tandem that includes 2x8 balanced analog and S/PDIF and ADAT optical digital I/O connectors. The Gina24 and Layla24 come with Windows 95/98/NT, Macintosh and BeOS drivers, and Echo plans to soon add Mac and BeOS drivers to the Windows-based Mona.

What better name to associate with the digital I/O train station motif than EgoSys' Waveterminal 2496 ($489), now also on Mac tracks. It sports ASIO 2.0 drivers, direct digital input from CD-ROM and, as the name also implies, 24-bit/96kHz audio performance. EgoSys also released the WaMi Rack 24, U2A USB Audio Interface, Audioterminal 24 and Audiotrack 2000 since January '99. WaMi Rack 24 ($769) is a 4-in/8-out rackmounted audio interface for PC, with 64 channels of MIDI control and a SMPTE synchronizer built in. The U2A ($300) is a 16-bit version of its USB Audio Interface that also does real-time sample rate conversion for Windows and Mac. Rounding out EgoSys Central are the Audioterminal 24 ($699) and the Audiotrack 2000 ($399).

Its Audiowerk8 has been routing audio tracks for a while, and now Emagic's cross-platform Audiowerk2 Production Kit ($299) adds a variety of handy software tools to the same 2x2 analog and digital S/PDIF interface. Mac users get Emagic's MicroLogic AW2 sequencing application and Waveburner AW2 for burning Red Book audio CDs. PC Audiowerk2 packages come with Emagic's Logic Audio Composer, and both versions come with ZAP (Zero-Loss Audio Packer) for transferring audio files fresh off the Web. Eighteen-bit ADA and MME, ASIO and Sound Manager drivers round out the new Audiowerk station.



Frontier Design's WaveCenter/PCI

E-mu/Ensoniq's popular PARIS system was released before '99 but has new software features and hardware expansion options worth noting for its cross-platform PARIS Bundle 3 package ($4,195 base system). An ergonomic hardware control surface, PCI card, PARIS software and rackmounted modular expansion unit are included. New upgrade options include a SMPTE module ($699) and the EDS-1000X expansion PCI card ($1,595), the latter adding 16 tracks per card up to a 128-track maximum. Version 2.0 Paris software now also supports SMPTE and VITC.

WaveCenter/PCI ($389) from Frontier Design includes the company's 8x8, 24-bit Tango24 external analog-to-digital converter interface. It can use ADAT optical, Toslink S/PDIF, MIDI, and ASIO or Gigasampler drivers to reroute even the busiest track sheet from station to station. Formerly an ISA-based card, the new WaveCenter/PCI can also be stacked with Frontier's 4x8, 20-bit Zulu analog audio interface.

Two more choices for adding four channels of high-quality, 24-bit audio to any PC are the Wave 424 ($269) and Wave 496 ($349) from Gadget Labs. The 424 provides 4x4 unbalanced ¼-inch connectors in a breakout bundle that are +4dBu-switchable via software, a MIDI I/O adapter cable and 96kHz upgradability (included free with current bundle). S/PDIF and ADAT digital connectors are available options. The Wave 496 is Gadget's latest audio track I/O card that supports 96kHz sampling rates and puts four balanced ¼-inch inputs and outputs into a good-looking, half-rack breakout box.

Guillemot added the new Maxi Studio Isis ($299) to its PC audio I/O sound card lineup, a 20-bit tracking solution that provides eight ¼-inch inputs and four outs on the analog side, and optical and coaxial S/PDIF digital I/Os. MIDI in/out/thru connectors are mounted in an external rack, and 32-to-48kHz sampling rates are supported. The company has a community Web site for Isis users to share information and files at www.maxistudio.com.

Initially released for Mac multitrackers, the OASYS PCI ($2,200) is Korg's latest Open Architecture Synthesis, effects and audio I/O card gone cross-platform. Eight-channel ADAT optical, stereo S/PDIF, BNC word clock and stereo analog I/O connections are provided. OASYS also brings 130 Trinity-

ONE DAY THEY'LL FORGET THAT A RECORDING STUDIO USED TO TAKE UP AN ENTIRE BUILDING. THAT WOULD BE TODAY.

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based effects algorithms, 24-bit audio throughout, and an expandable synth engine that produces modeled analog synths, tone-wheel organs and percussion sounds that are easily upgraded via disk. The built-in submixer, 12-channel inserts and an unfathomably long 160-second maximum delay time mean the OASYS onboard chips can take the strain off any overworked host CPU.

The Lynx line of studio connectivity solutions now includes its LynxONE ($549), a 24-bit I/O card that supports 32-to-96kHz digital sampling rates; word, super, video and MIDI clock sync; and AES/EBU or S/PDIF transfer for Windows 95/98/2000/NT 4.0 users. A custom cable bundle from the ONE includes XLR audio, clock and MIDI connectors, the latter supporting up to 32 channels.

Launching from the already-popular 2408 platform are five new cross-platform audio I/O turnstyles from **Mark of the Unicorn**. The new 2408mkII ($995) replaces unbalanced RCA with 8x2 balanced ¼-inch TRS connectors, and is designed to provide an improved 105dB signal-to-noise ratio. The mkII, supporting TDIF, ADAT optical, S/PDIF and word clock protocols, can be expanded modularly up to 72 channels at $695 per 8-channel expansion unit. The 1296 core system ($2,095; $1,795 as an expansion box) includes 12 balanced +4 XLR and AES/EBU digital I/O, and a large selection of software drivers; it can be expanded up to 36 channels, and the 1224 ($1,195 core) includes 8x10 analog I/O and can be purchased as an expansion unit for $995. Rounding out

A BUYER'S GUIDE TO DIGITAL AUDIO CARDS

MOTU's extensive I/O family is the new 24i ($1,495 core, $1,195 expander), featuring 24 balanced +4 TRS inputs and S/PDIF I/O, and the 308 8-channel I/O expander ($695).

Windows users can look to the new Mykerinos High Performance PCI Audio Board ($1,195 and up) from **Merging Technologies** for 24-bit audio performance. This half-length PCI card includes the company's PyraMix Virtual Studio software, SMPTE, VITC, TDIF, AES-EBU and MTC sync, and options for supporting a sampling rate up to a 192 kHz and ADAT digital I/O.

If you need 100,000-track support, 32,000 locate points, and you want to edit and mix files directly from a CD-ROM drive, check out **Micro Technology**'s new MicroSound Krystal (starting at $1,595). A host of multitracking, CD mastering, noise removal, pitch shift and sample rate conversion tools are included, and this Windows 95/98/NT, 2x2 analog I/O card also sports AES/EBU and S/PDIF connectors, and 24-bit maximum resolution. It is exandable with the company's MicroSound external I/O module.

From the **Midiman** family comes MAudio, a new maker of digital audio I/O cards that's released five new products since Winter NAMM '99. The cross-platform Delta 44 ($399) doesn't have digital ins and outs, but it more than makes up for that with 24-bit/96kHz audio performance, DirectX and VST plug-in support, and a wide range of ASIO, GSIF, DirectX, EASI and Linux drivers to fit most any software configuration. The Delta 66 ($499) adds stereo S/PDIF I/O. The Delta 1010 ($999) sports 8x8 ¼-inch analog and digital S/PDIF connectors, word clock and multicard support, and 16-channel MIDI operation. Rounding out MAudio's new offerings is the Delta DiO 24/96 ($299), an affordable card with gold-plated, +4/-10 analog, and S/PDIF and Toslink digital I/Os that also support Serial Copy Management System (SCMS).

Mytek Digital teamed up with **Sonorus** to release the Mytek DAW 9624 ($6,495), another expandable audio central station that starts with an 8x8 XLR I/O configuration; four pairs of AES/EBU and ADAT digital connectors; 24-bit ADA; and Mac, Windows, BeOS and Linux platform support. Word clock and video sync are also standard equipment, as are MIDI control, 96kHz support, and ADAT-to-AES/EBU digital format conversion.

Helping every mouse-challenged PC audio user is **Peavey**'s StudioMix ($899.99). Bundled with Cakewalk's flagship Pro Audio 9 software, Peavey's

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hardware interface includes eight motorized faders, a jog/shuttle wheel, and eight RCA analog I/O connectors. Up to 48kHz support and SMPTE, MTC and MIDI control round out this ergonomic wonder.

Two new PC turnkey audio systems from SADiE include the Artemis ($15,495 entry level) and the SADiE 24 96 ($12,995 on up). Artemis comes with a Pentium III CPU, 8x8 connector breakout rack and AES/EBU digital I/O for every channel. Also included is full timecode support, balanced XLR connectors and a host of bundled SADiE 3 software for surround panning, PQ list editing and music editing tasks. SADiE's 24 96 is targeted for film and TV post, dialog, music and DVD mastering professionals. It is able to play back and edit 24 tracks of 16-bit audio, and support a sampling rate up to 192 kHz. Portia nonlinear video playback is an option.

A pioneer in synthesis, Seasound's Tom Oberheim continues to blaze new trails in cross-platform audio with the company's SoloEX ($849.95), a8 ($699.95) and Solo Expander ($399.95) audio I/O interfaces. The SoloEX is a good-looking 2U rack I/O box, with 4x2 analog which replaces a mouse with rotary knobs for controlling the EX's dual mic and guitar preamps, headphone amps, and monitor and computer audio mixes. The SoloEX can be expanded with the company's a8 and Solo Expander options. The a8 adds front panel-switchable +4/-10 inputs, clock source switches and comes with 8x8 analog I/O, and the Solo Expander, due this summer, is basically an a8 racked on top of a SoloEX that adds an additional four balanced analog I/O connectors to the SoloEX. Mac users get Steinberg's Cubasis VST; PC fans get Sonic Foundry's Acid Rock.

SEK'D added three new cards to its long line of PC audio I/O solutions. The Prodif Plus ($499) provides 48kHz stereo analog and up to 96kHz support on S/PDIF, AES/EBU and ADAT digital ins and outs. Audio files can be fed directly into the Plus from CD-ROM, and copy protection is ignored. The Prodif96 Pro ($699) comes with the same I/O, bit rate and clock sync options as the Plus; it boasts a 93dB signal-to-noise ratio and runs an automatic hardware self-test on every startup. Siena ($499) doesn't support digital I/O but offers cross-platform and 32-channel MIDI support, a MIDI data filter and 24-bit ADA. It comes with a range of software drivers and SEK'D's Samplitude Basic multitracking and editing software.

A BUYER'S GUIDE TO DIGITAL AUDIO CARDS

Sonorus' STUDI/O I/O cards are part of Mytek's previously mentioned products, but Sonorus also distributes a line of Swissonic-built, USB-based solutions for Mac and PC users. The USB Studio ($699) has six mic, instrument and phono inputs with switchable phase inversion and phantom power, back panel insert jacks and 20-bit ADA with 128x oversampling. USB Studio D ($849) adds 2x2 optical and coaxial S/PDIF or Toslink I/O to this Sonorus/Swissonic team effort.

Based on audio software for the Windows 98/NT and Windows 2000 platforms, Steinberg's Nuendo system is designed for the film/video post and interactive media production. The basic Nuendo 96/52 card supports up to 52 channels of 24-bit/96 kHz digital audio via three ADAT Lightpipe I/Os and S/PDIF stereo I/O with both word clock and 9-pin ADAT sync. The card is a PCI bus-master device working exclusively in 32-bit transfer-mode, moving audio data directly to and from the ASIO host application's memory using fast PCI bursts. ASIO 2.0 drivers for Windows 98 and NT, and Windows 98 MME wave drivers are included; optional are outboard 24/96 converters, and an external MIDI/SMPTE/digital audio synchronizer.

Aiding the mouse-challenged audio user is Tascam's new US-428 ($599), a cool blue hardware interface that provides faders, transport controls, jog/shuttle wheel and a MIDI interface for Mac and PC users via a single USB port (no PCI card required). User-configurable effects, 4-band parametric EQ, stereo S/PDIF and 24-bit ADA converters are standard equipment, and Steinberg's Cubasis VST comes bundled with the US-428.

A number of affordable PC audio I/O cards were released by Voyetra/Turtle Beach during the past year. Heading the list is the Montego II Home Studio ($249.95) with dual onboard; Roland GS-compliant synthesizers; 18-bit ADA; optical and coaxial S/PDIF digital I/O; MIDI in/out; onboard effects; and a software bundle that includes Voyetra's Digital Orchestra Pro, AudioView 32 and Bank Downloader for grabbing downloadable samples (DLS) from the Web. Rounding out VTB's new releases are its Montego II with digital I/O ($149.95), Santa Cruz ($99) and a range of new expansion options that include the CancunFX ($79.95) wavetable synthesis daughtercard.

Users can roll their own customized PC turnkey solutions at Wave Digital's Web site, where there is a wealth of CPU, drive, software and peripheral pull-down menus. The StudioPC PIII Power Tower system (starting at $1,199) includes numerous hardware and software options for building the perfect audio I/O beast. DirectX and VST plug-ins are supported, as are options for all sample rates, word clock and SMPTE sync, 256 virtual tracks, CD-RW drives, monitors and sample rate converters. A wide range of bundled software can also be added to any Power Tower online shopping cart.

Another system-based studio solution comes from Xytar Digital Systems. The new ADMS32 ($3,999 on up) is a 32-track studio-in-a-box that comes with a full Pentium PC and a 32-channel, 24-bit hardware mic mixer for the ultimate plug-and-play studio. The mixer has ultralow-noise mic preamps and 4-band parameteric EQ per channel, and the bundle includes Xytar's Music Webcaster software for encoding and uploading MP3 files directly to the Web. Included are FTP upload/download software, an internal 56k modem, Netscape Communicator and a free ISP account with a Web site for instant audio uploading.

The heart of Yamaha's DSP Farm system is the DS2416 I/O card ($999). Essentially a computer-based version of its legendary 02R digital mixer, REV500 effects processor and then some, the cross-platform DS2416 features Windows ASIO and Mac G4 drivers, dual effects engines, channel delay, and it can record eight simultaneous tracks of 32-bit audio. Stereo coaxial digital I/O, more than 100 bands of parametric EQ, and 26 dynamics processors are at hand. Yamaha's optional AX44 Audio I/O Expansion unit and AX16-AT ADAT optical sync box can be added to expand the Farm. ■

Randy Alberts is a San Francisco-based writer, musician and Mix *contributor.*

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The PATRIOT

BY TOM KENNY

The Sony Pictures Entertainment lot was abuzz at the end of May with the controlled rush to bring Mel Gibson and the drama of a family caught up in war to the big screen. From the remodeled Cary Grant to the William Holden and all-new Burt Lancaster theaters, with Foley and ADR working overtime and John Williams sessions in the historic scoring stage, the sound crew was, to quote re-recording mixer Kevin O'Connell, "all blazing." The goal, from Lee Orloff's production recordings to the preparation of tracks at Soundelux and the final mix at Sony, was to support picture and story in a natural way.

It seems so obvious that it makes you wonder why it hasn't been done before: A big-budget action-drama about the Revolutionary War, with an A-list star, opening just before the July 4 weekend. (Okay, there was the 1985 turkey *Revolution*, with a miscast Al Pacino. Hollywood has a long memory when it comes to grosses.) But the possibilities appear endless, the landscape immense, with sweeping battles of red vs. blue and the inherent promise of the birth of a nation. Yet, when Columbia Pictures bought the screenplay for *The Patriot*, it was the family drama inside the historical drama that attracted the talent and pushed the picture beyond the typical summertime fare.

The Patriot balances the intimate and the epic on every level, from script to photography to acting, and certainly with sound. Mel Gibson plays Benjamin Martin, a guerrilla hero of the French and Indian War who has put his brutal past behind him and adopted the life of widower family farmer in South Carolina raising his seven children alone.

As the threat of conflict with England looms, he speaks out against war. His firstborn son, meanwhile, believes passionately in the cause and enlists in the Continental Army, then the militia. When the war comes literally to Martin's doorstep and his family is attacked by the rogue Colonel Tavington, the reluctant hero enters the fray to save home and country.

It's a simple story, but it's told with such deftness and poignancy that audiences and critics are sure to respond. Robert Rodat (*Saving Private Ryan*) penned the script, which was beautifully

PHOTO: ANDREW COOPER/COLUMBIA PICTURES

Natural Soundtrack Brings Clarity and Detail to Revolutionary War Saga

the harsh manner that led OSHA into Hollywood five years ago. The big scenes are really more dense and full than loud, and the five screen channels were crucial in providing the separation from retreating Americans on the left and charging Brits on the right.

Some of the battles are small skirmishes, and some ranged across miles of open fields. In either case, the approach at the effects premix was the same. Russell automated the close-up guns first (typically adding a "snap" with a 1.5 to 2dB boost at 3 kHz, with the "thunder" out the center channel and the high-end report out of channels 2 and 4), then the medium distant guns, then the offstage. That's one predub. Then he went back and did bullet whiz-bys on 1-3-5 of a second predub, with body impacts on channels 2 and 4. Next came a gun mechanism predub, where the "chink" came out the center channel two frames before the explosion, followed by a "poof" of smoke out of channels 2 and 4, with reverb across all five front channels to fill it up. Finally, he tackled cannons (firing sound, traveling sound, explosion) on a separate predub, using channels 2 and 4 for debris.

When you consider that each musket or pistol shot is a three-part sound (mechanism, fire, whiz-impact), and that mechanism sounds of an army preparing to fire need to travel left to right, as do the bullet whizzes, that's a lot of passes on the console for even a small battle. It helped that Russell knows guns, but even he was thankful for the slower, richer, character-laced report of muskets and pistols, and not AK-47s.

The gun sounds are definitely unique, and according to Russell they had plenty of low end

FILM STILL: ANDREW COOPER©COLUMBIA PICTURES

BIG MOVIE, TIGHT SCHEDULE

Clarity and detail are often sacrificed when a post-production schedule gets as tight as it was on *The Patriot*. In the middle of May, with the film's release just six weeks away, the team was wrapping up the premixes on three stages at Sony. O'Connell finished up the dialog on the William Holden Theatre a day later, as Russell was honing gunshots and horses in the effects premix for reel 8AB in the new Burt Lancaster Theatre across the hall. Meanwhile, pinch hitters Greg Orloff and Chris Carpenter, were tackling the Foley in reel 7 on the reconditioned and sweet-sounding main stage (and O'Connell's and Russell's true home), the Cary Grant Theatre.

Less than four weeks earlier, the Cary Grant had scaffolding from floor to ceiling. A brand-new Harrison MPC was installed in late April, in time for Foley to shake down the room, and on Friday, May 19, the day before the final mix was to begin, producer Dean Devlin and O'Connell made the decision to switch from the William Holden to the Cary Grant. A small army of engineers and assistants began moving workstations and setting up, while O'Connell and Russell laid out the board and reviewed the Harrison's new features with Carpenter. The final began the morning of May 20. The drop dead for the print master was June 9.

That means there was only a little more than five weeks, from premix to print master, on a 9AB reel movie (three hours). Even by current standards, that's a tight schedule. "This movie has everything but time," says supervising sound editor Per Hallberg, who began on the film in February after finishing up *Gladiator*. "A great story, great acting, great adventure, great photography—everything that you need in a movie except time for us at the end. I work with a really tight crew that works together all the time, but we can add people in editorial and work six or seven days a week. When you come to mixing, however, there is nowhere left to go, and it's not because the mixers aren't fast. This is a massive job, and we wanted Kevin and Greg to do as much of the predubbing as possible to keep consistency and let them know the material. We needed their taste in the predub."

O'Connell and Russell handled all of the effects and dialog premixing, and, like Hallberg, they stress the collaborative effort that brought the picture out on time. "We've been fortunate to have a dream team of support on this film," O'Connell says. "Chris Carpenter and Greg Orloff premixed all the Foley, and we know that it will lay right in at the final. Then Steve Maslow and Sergio Reyes helped out with some additional hands on sheets and faders. Excellent support. Also, the film editor, David Brenner, is a huge part of how this movie sounds and he plays a major role in the mixing process. We had the benefit of temp-dubbing the movie with him and working out a template of how the final will be structured.

"When we started this picture, it was going to be one stage, one crew," O'Connell recalls, "so I'd like to acknowledge the people at Sony—from Gary Martin to Jim Honore's office, straight through to Michael Kohut and Richard Branca—for making this possible and dealing with the juggling of schedules." *—Tom Kenny*

At the William Holden Theatre, re-recording mixers Greg Russell (left) and Kevin O'Connell surround Sony's Richard Branca, senior vice president sound, video and projection (seated).

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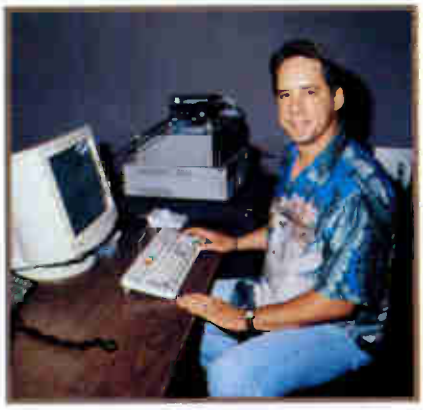
built in so that he didn't have to dial in "boom" at the mix except when he wanted to add emphasis. What couldn't be found in the extensive Soundelux library (and this is the editorial house that did *Last of the Mohicans* and the Civil War film *Glory*) was recorded in the canyons of Frasier Park, near Los Angeles. On a big show like *The Patriot*, Hallberg prefers to split up his crew by categories, so David Baldwin cut most of the muskets and pistols. (Randy Kelly cut the horses, "the vehicles," as Russell called them; Chris Assells, Dino DiMuro and Dan Hegemann worked on miscellaneous explosions, fires, cannons and design elements.)



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ADR supervisor Chris Jargo feeds the stage from his WaveFrame workstation.

There are a couple of moments inside the battles where the filmmakers use slow-motion photography to suck the audience into the personal battle-within-a-battle. Here, score will be big, and sometimes breathing or Foley will carry the effects track. "I think we'll be pulling effects way back and into reverb, almost nonexistent, allowing score to carry," Russell says. "How effectively we come in and out of those surreal moments will probably be the biggest challenge for me."

EXTERIOR ADR

While the guns provide the flash and sizzle of the battle scenes, the editors and mixers placed equal attention on the "textures" of the field, perhaps most evident in the group ADR recording and mixing. The battles were by and large marked by civility, at least until the initial firing ceased and the hand-to-hand combat began. Military commands, therefore, were prominent. To add a level of realism, Hallberg decided to shoot the group ADR outdoors.

"We went up to the old Nike missile base in the Santa Monica Mountains," explains ADR supervisor Chris Jargo. "Down a fire road and behind a mountain so we would be shielded from traffic. We placed 15 men [from the L.A. Mad Dogs loop group] about 10 feet apart down the road and had them run through a series of commands—everything from arms commands for Americans and Brits, to cavalry commands, marching commands, cannon commands. The way it works is that a commander barks out a command, and there are six companies in a battalion, so the leaders of those companies would parrot the commands. For example, if the command was, 'Take aim!' we would stagger the repeat with the 15 guys, so that the guys farther in back would be a little out of tempo, not perfectly chorused.

"Then after the group commands, we would do individuals," he continues, "which Kevin would then mix LCR, again staggered and offset. The individuals played with the 15 men to give it a real natural, rough sound. We did that for every command, in every battle, and we also did group grunting and fighting for the hand-to-hand combat." Later, "free-and-clears," or wild, individual lines, were recorded to add punch

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and poke through the group walla in the encampment scenes.

O'Connell broke out separate predubs—6-channel production, 8-channel principal ADR, and 8-channel group ADR (LCR-LS-RS, LCR)—for the Americans and the British, so that at the final he could have flexibility and not bottle up the center. "I like to make the commands and the group dialog as left and right as possible," he says, "because by the time you put in the guns and music, you need that separation. Sometimes I'll even put group in the left-surround and right-surround so that it feels like one whole side of the theater against the other side."

The exterior group ADR sessions were recorded straight to two DAT machines, one set up double-mono (two tracks) and the other stereo (M-S miked, for LCR playback). The five tracks were then lined up in the WaveFrame so they could be played back at the same time. Close-up grunts and breathing, along with principal ADR, were recorded on ADR stages at Fox, Warner Hollywood and Sony.

PHOTO: ELIZABETH ANNAS © 2000

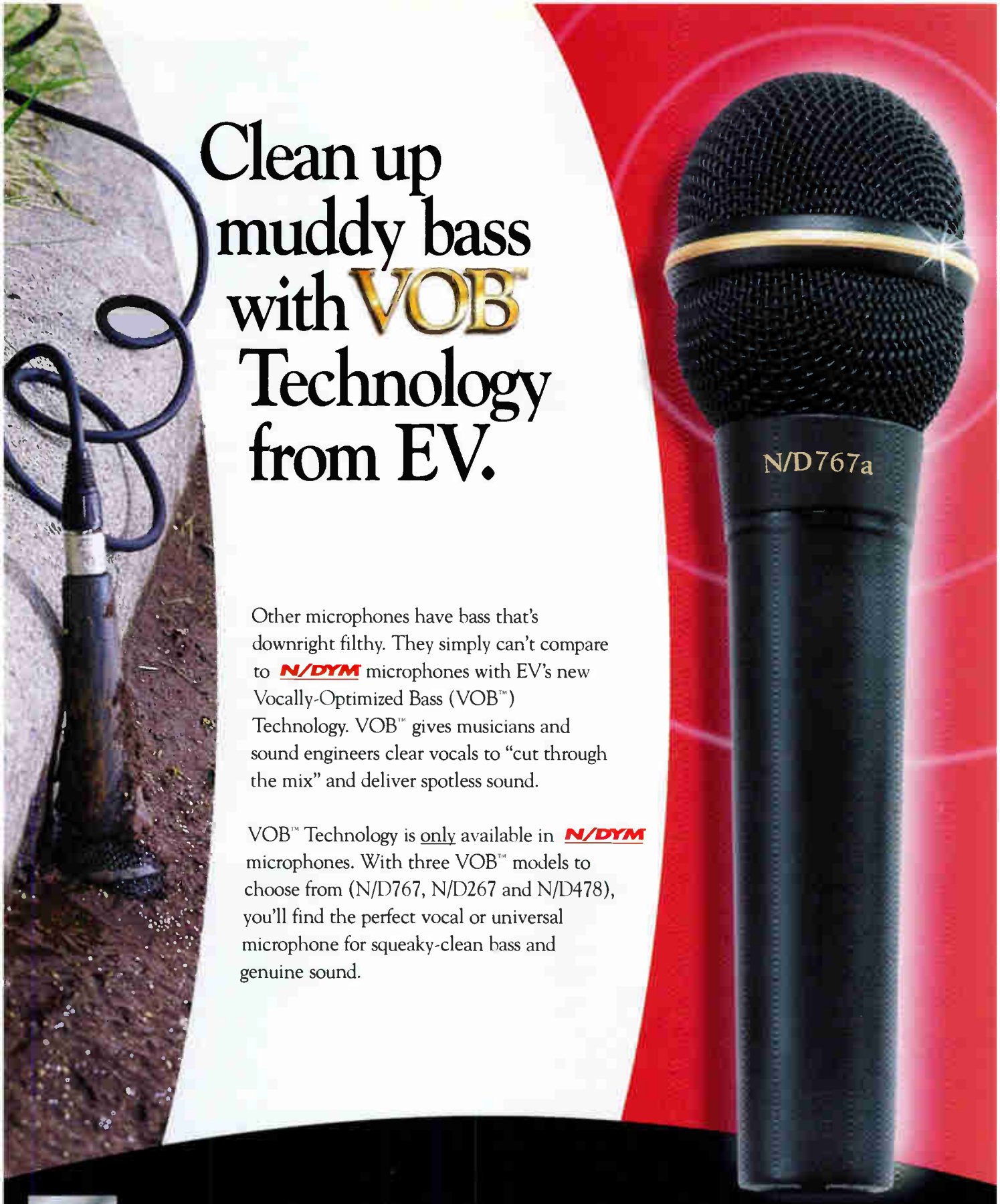
The massive Foley job, including musket mechanisms, leather creaks and armies' worth of footsteps, was handled on Foley Stage A by the crew of, L to R: Matt Dettman, Foley artist; Gary Hecker, supervising Foley artist; and Richard Duarte, Foley mixer.

FOLEY

In order to help meet the time crunch, and as part of his own aesthetic, Hallberg divvied up Foley and effects early on so that there was no doubling up. That way, for instance, effects handled gun cocks, which might typically be a Foley moment, while Foley regularly fed sync effects—most notably, individual horses (hooves and tack)—to the effects editors to cut in and flesh out prior to the mix.

For the battle scenes, Foley artist Gary Hecker began with principal footsteps, then, with headphones on, did principals' gear. After a pass for group feet and gear, he then went back and did close-up gear, rifle movement, body falls, horse falls and miscellaneous. To cut down on the number of tracks, Foley mixer Richard Duarte sometimes mixed group gear and feet together. "We had to create size and clarity and definition without going out to a lot of tracks," Hecker says. "Everybody wanted to work in a condensed format on this film—but packed with dynamite, so to speak."

To begin, Hecker scoured area armory stores for antique rifles with wood stocks, bayonets, all types of leather belts



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for movement and creaks, saddles, and even a creaky rocking chair, which is a small story point. After initial sessions with horse specifics (hooves, saddle, bridle), which the Foley crew then shipped to the effects editors, Hecker started in on wagons, harnesses, creaks and wheels. Then he went on to individual characters.

"Each character had his own equipment," Hecker says. "Tavington [the out-of-control British colonel] was always wearing a scabbard, so his sound was a creaky leather belt and scabbard, with some military cloth, and he was walked with authority. He's real starchy. Mel, in battle, had his tomahawk, pistol, dagger and musket—always associated with those sounds. Then when we get to the battle scenes, we have to make sure the patriots sound different from the redcoats."

"The militia is a little more leathery and musket-types, a more floppy sound and not so tightknit," adds Foley supervisor Craig Jaeger. "The British are more military, more proper-sounding. They're tight, and they have a clank to them that shows the authority they think they have. Not as many rattles to their belts, and a more solid-sounding gun."

Gun movement and handling was, not surprisingly, a big job. Hecker used a Neumann KMR81 for a lot of the brute work, with a Sony 800G, a vocal mic, to bring out details in the mechanics for close-up work. For definition, he says, they recorded two layers on the rifles: a normal mode to capture the high end, and a "thick" mode for the low end. But it wasn't all work and no play. Hecker also provided an eerie vocal wind and a stylized, processed bayonet drop that is played at crucial moments in the climactic battle.

EVERY WORD COUNTS

"This is not an action movie," says Hallberg. "It's big, spectacular, and has all those elements, but it's really about a family and about values. That's the heart of it, and that's where we need to make it feel right. The whole setup is for us to connect with the father and his family living a beautiful life, so we make it sound soft and beautiful. It's about emotion, and you need Mel's voice to have that chesty, rich quality coming through in the quiet dialog scenes."

"Mel's voice is edgy, deep and rich," adds O'Connell, "which is why I like it. Everything in production was so well recorded that it captured that warmth and richness. I plan to just play it on

A SCENE MADE FOR SOUND

PHOTO: ELIZABETH ANNAS © 2000

Re-recording mixer Greg Orloff (left), who handled the Foley predubs, and Foley supervisor Craig Joeger of Soundelux.

A viewing tip: Watch for the scene where Colonel Tavington, on a search-and-destroy mission with a small cadre of British troops, enters the home where Gibson's family is hiding. It takes place at night, with torches blazing. At one point, Tavington thinks he hears a sound and silently enters a room where the family, except for one son, has just fled through a trap door.

"At that point, it will be all-Foley," says Foley supervisor Craig Jaeger. "Tavington's movement from his gear, big, ominous footsteps with a little bit of spur, and a big wood floor creak."

"I started with Tavington's footsteps," says Foley artist Gary Hecker. "He's the villain, and he's wearing these big horse-riding boots. The feet are critical because he's in stealth mode, walking with giant close-ups on his feet. After his boots, I put on headphones and topped his footsteps with spurs—just enough ring. Then I did leather creaks of his belt in sync with his feet and spurs, for every move. He stops, bends over, looks around, turns his head. Then I went back and added his scabbard, then his pistol movement. After that there's a giant close-up of his feet, and a dirt spray where the kids can see it from underneath the floor. Then I went in and added floor creak under his feet. When you play back this scene, it just comes to life and creates all the tension and drama."

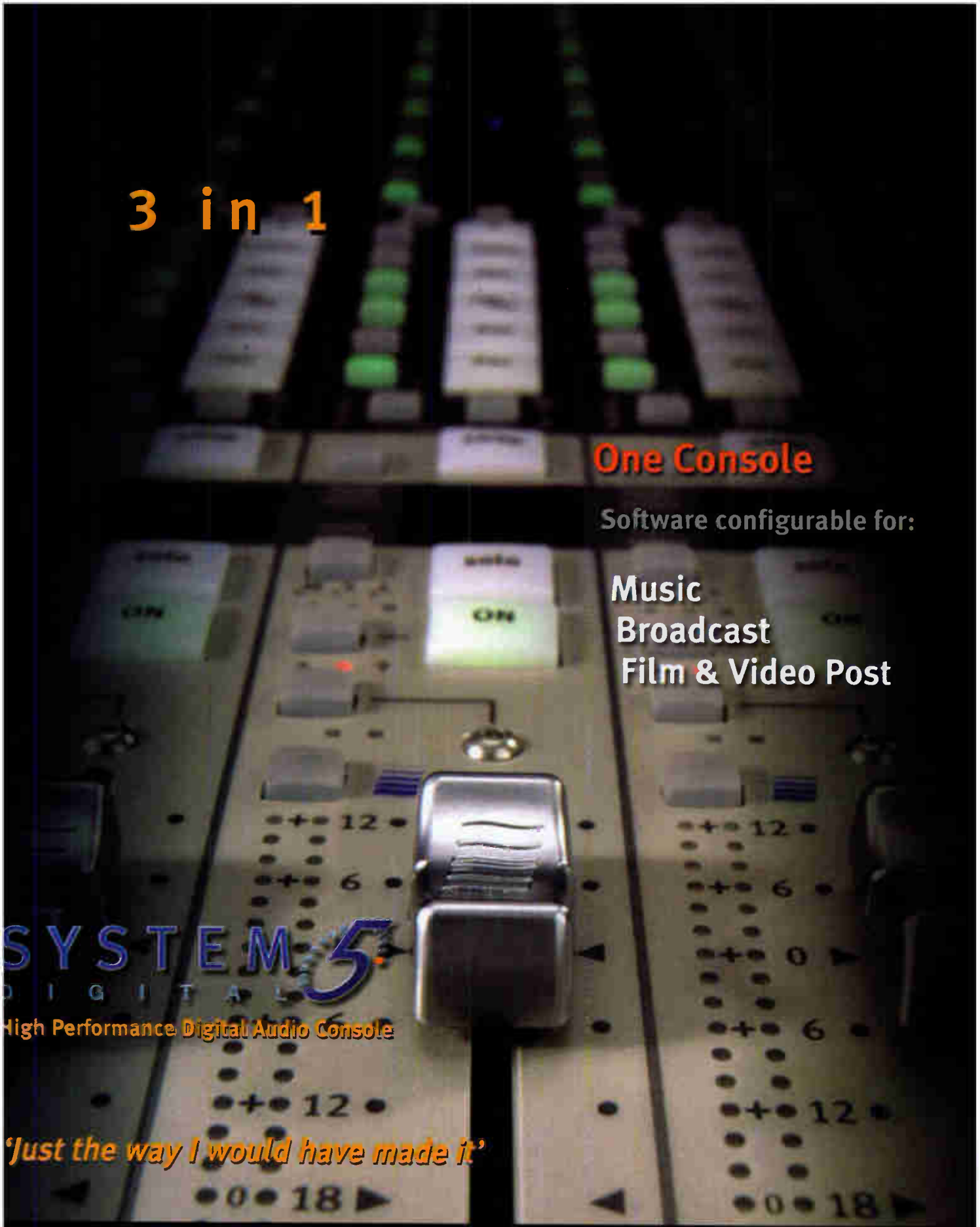
"I think we've all had the experience where we've hidden with people in the room, and all you hear is the sound of your own breath," adds Kevin O'Connell. "The kid is stuck under the table, and I'm planning on focusing on his timid, scared breath and the sound of the bad guy's feet. Everything else should be distant, echo-y and surreal at that point." —*Tom Kenny*

The Patriot Sound Crew

The re-recording, Foley and scoring took place at Sony Pictures Studios

Re-Recording Mixers: Kevin O'Connell, Greg P. Russell
Additional Re-Recording: Greg Orloff, Chris Carpenter, Sergio Reyes, Steve Maslow
Re-Recordists: Dan Sharp, Fred W. Peck III, Tom Burns
Cary Grant Theatre Stage Engineer: Hanson Hsu
Foley Artists: Gary Hecker, Matt Dettmann
Foley Mixer: Richard Duarte
Music By: John Williams
Scoring Engineer: Shawn Murphy

Editorial Services by Soundelux and Sony Pictures
Supervising Sound Editor: Per Hallberg
First Assistant Sound Editor: Karen M. Baker
Sound Effects Editors: Christopher Assells, Dino R. DiMuro, M.P.S.E., Dan Hegeman, M.P.S.E., Randy Kelly, Harry Cohen, M.P.S.E., Scott Sanders, M.P.S.E., David Baldwin, Peter Staubli
Supervising ADR Editor: Chris Jargo
ADR Editors: Michelle Perrome, Laura Graham, Michelle Pazer
Dialog Editors: Lauren Stephens, M.P.S.E., David A Cohen
Supervising Foley Editor: Craig Jaeger
Foley Editors: Lou Kleinman, Paul Jyrala, M.P.S.E.
Assistant Sound Editors: Philip D. Morrill, Drake Jenevein, Bob Bowman, Tony R. Negrete, M.P.S.E., Lee W. LeBaigue, Christopher Winter, Janelle Showalter
Production Sound Mixer: Lee Orloff
Boom Operator: Knox White
Assistant Boom Operator: David Acord



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the screen that way. There was surprisingly little ADR in this movie, which is a credit to Lee [Orloff] and his crew. We had a lot of group ADR, but not a lot of principal ADR. These tracks are stellar."

Production mixer Lee Orloff recorded digitally to a 4-channel Nagra D and was able to use boom mics (boom operator Knox White and assistant David Acord) a majority of the time, which accounts for some of the richness and naturalness in the tracks "When you look at the work tapes that we're cutting to and you see the boom [mic] in the top end, just out of the frame line...well, it's very seldom that you see that these days, with somebody who dares to get in there and stay right on the edge," Hallberg says. "A big hats off to Lee and his crew. Every time I see that boom above the frame, I think, 'That's my man!'"

"Bringing the shoot to the Low Country of South Carolina, where the actual events took place, was one more example of the filmmakers' desire to maintain historical accuracy throughout the production," Orloff says.

"We reduced intrusions of 20th century life onto the track by the typical road closures and by keeping a handle on local train and plane scheduling. But we also had to eliminate the hazards of 'friendly fire'—maintaining tight base camp lock-

PHOTOS: ELIZABETH ANNAS © 2000

You can't mix a big film, on three stages, without unflappable engineering support. The team at Sony: VP of engineering Mark Koffman (center) and his crew, L to R, Paul Wood, Mark Onks, Bill Banyai, Floyd Banuelos and Hanson Hsu.

Keeping the re-recording team happy and moving forward were recordists Dan Sharp, left, and Fred Peck III.

ups and generator baffling, and control over special effects foggers, smokers and wind machines. We would often hand out Comtek wireless recievers with dialog feeds to the effects operators, along with 'sides' for them to read so that they could help pull down particularly noisy elements on cue in an effort to keep the dialog clean.

"Stereo mic configurations were used extensively during the battles and were laid down on two of the four channels," he continues. "Once the atmosphere had been tamed, the ambient levels supported the use of multiple booms for the majority of the principals' dialog recording, ensuring proper perspectives on those tracks. The multichannel format allows us to deliver a mixed mono for dailies and editorial, while at the same time preserving clean pre-fader outs to protect the inevitable overlaps and paraphrasing, which occur from time to time. The higher bit rate of the Nagra enables a natural, fuller and more dynamic recording to be made than is possible with 16-bit mastering formats. We then made certain to interpolate, rather than truncate, the additional information contained in the longer word length when the tracks were loaded digitally into the DAWs."

All four tracks were loaded digitally into WaveFrames for editing, then laid back to Sony DADR-5000 playback machines. It was the first time Hallberg had a completely digital dialog chain, with no analog conversions.

"My biggest goal as the dialog mixer is intelligibility," O'Connell says. "You have to understand every word, and I live by the fact that there are no rules to doing dialog right or wrong. I'll use fractions of words from the loop, fractions from production, and I'll use crazy EQ in order to understand the line. But I probably process the dialog less than anybody I know. When I first started mixing dialog [in 1987], I would take out every hum, buzz and rumble at the predub. I would use dip filters, CATs [43 or 430 Dolby single-ended noise reduction units], compressors, de-essers. But over the years, I've literally got down to using almost nothing except a little compression and de-essing in the predubs. By the time you put in the music, BGs, Foley and everything else, you can't really hear those extraneous sounds in the dialog track, and by stripping them out, you can't help but strip away some of the richness. Once I'm in the final mix, if a sound still pops out, I'll address it then."

Like most dialog mixers, O'Connell finds the intimate scenes more of a challenge to mix than the battle scenes. At one point in the film, Mel Gibson's character is talking to his sister-in-law in a refugee camp near the beach. The surf is present, and O'Connell found that he needed to brighten up Gibson's voice just a tad, without brightening the water. "I'm going to try to combat the water with an ultrahigh-frequency attenuation technique," O'Connell explains. "At the final, I'm going to reach up for some high freqs between 12 and 15 k and roll off. When you do all this EQ below 10 k, you ultimately contribute to high-end 'rizz.' But if you attenuate considerably at, say, 12 to 15 k, you can round the track to where it doesn't feel so edgy."

TEAMWORK

It would be verging on cliché to talk about the "armies" of sound personnel marching into battle and employing true teamwork to accomplish the mission of this June 28 release. But the truth is it *was* an enormous team effort, beginning with Hallberg sitting down with his crew for each reel and soliciting input, right on through to the premix and final at Sony (see sidebar, "Big Movie, Tight Schedule").

"Everybody's part of the process in coming up with ideas," Hallberg says. "My team will take my ideas a little bit higher, and then we take it to the dub stage and Kevin and Greg can see the intent and take it one step further. That's why the end result is better than you could ever do on your own."

On the eve of the final mix, after three weeks of premixing, O'Connell and Russell finally left the Cary Grant Theatre at about 8 o'clock after laying out the Harrison MPC for the final. "I can't wait for tomorrow," O'Connell says. "This is where the real magic happens. I've got John Williams in my left hand and Mel Gibson in my right. It's going to be an awesome experience." ■

Tom Kenny is managing editor of Mix.

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WALTER AFANASIEFF

GRAMMY-WINNING PRODUCER WITH A PLATINUM SOUND

PHOTO: COURTESY JIM MCHUGH AND NARAS

Just a shade more than 10 years ago, Walter Afanasieff's phone rang. Tommy Mottola of Sony Music was on the line asking if the young musician was interested in producing the last song on Mariah Carey's debut album. That song, "Love Takes Time," rocketed both the new artist and new producer to the top of the charts.

That was not the first time Afanasieff had been associated with a Number One hit. As a session player, songwriter and co-producer, Afanasieff worked closely with Narada Michael Walden during the late '80s. While in the Walden camp, Afanasieff contributed to albums by artists such as Whitney Houston, Lionel Ritchie, George Benson and Barbra Streisand.

The San Rafael, Calif., producer had already made his musical mark playing keyboards with the jazz/fusion violinist Jean-Luc Ponty. He also furthered his band career by forming The Warriors with another former Ponty sideman, guitarist Joaquin Lievano, and his days as a working musician paid off by giving him the background and confidence to take an active role as a producer. More often than not, Afanasieff adds keyboard beds and flares to the songs he produces.

This year, as the result of his work with Streisand, Kenny G, Marc Anthony, Ricky Martin, Babyface and Savage Garden, the 42-year-old Afanasieff won his first Producer of the Year Grammy Award.

So, how does "Grammy Award-winning producer Walter Afanasieff" sound?

It sounds delightful. It sounds good enough for me to get a good night's sleep, because part of my nature is to do the best work that I can possibly do, and the other half of my nature is to worry if it's accepted or if I get my peers' approval. I tell people this all the time: "It isn't about the money or the position of a hit; it's about the pat on the back that I get from my fellow musicians." So, literally to get the Producer of the Year Grammy [makes me feel] like now I can get a good night's sleep, because I know the people patted me on the back and said, "You did a really good job this year."

Do you feel like it's been a long time coming?

Well, working with other producers in the past, there was a minute where I thought being a producer was kind of like being a performer or being an athlete where you have your big years and then you fade out. Now I kind of feel, with people like David Foster and Phil Ramone and the breed and the caliber of a producer like George Martin, that it's really only been 10 years. In the tenth year, I got a Grammy for Producer of the Year. Well, in 10 more years, I'll get another one, hopefully, and then in 10 more years maybe another one. But in the scheme of things, it's not a long time coming at all, considering some of these fellows have been doing it for two or three times longer than I have.

Nowadays, it seems that listeners are more sophisticated. Do you think they are more demanding of a song and need to be impressed?

I think those things are chosen for the listener. I think the listener is the last to know, and the listener is going to hear it the way it got through the machinery and popped out the other end. We're all making better-sounding records every year, because everything is now tuned and quantized and meticulously recorded and on and on.

So, of course, we're making better-sounding records. Two or three years ago, somebody would be in the studio with a 24-track analog machine with the overdub capacity at the limit, and there's no more time in the recording studio. Today you don't have anything to worry about. Have Pro Tools? Go ahead, add 200 more overdubs. Let's pitch 'em all, fly 'em all in half an hour. So now with everything we have at our disposal, everybody's making the biggest, most amazing sounding records. I think it's great, because it gives us more to compete with, more to advance with. I think the listener is told, "This is the sound that's coming out now." It's not like anybody out there knows what it's about. Nobody can explain what

BY DAVID JOHN FARINELLA

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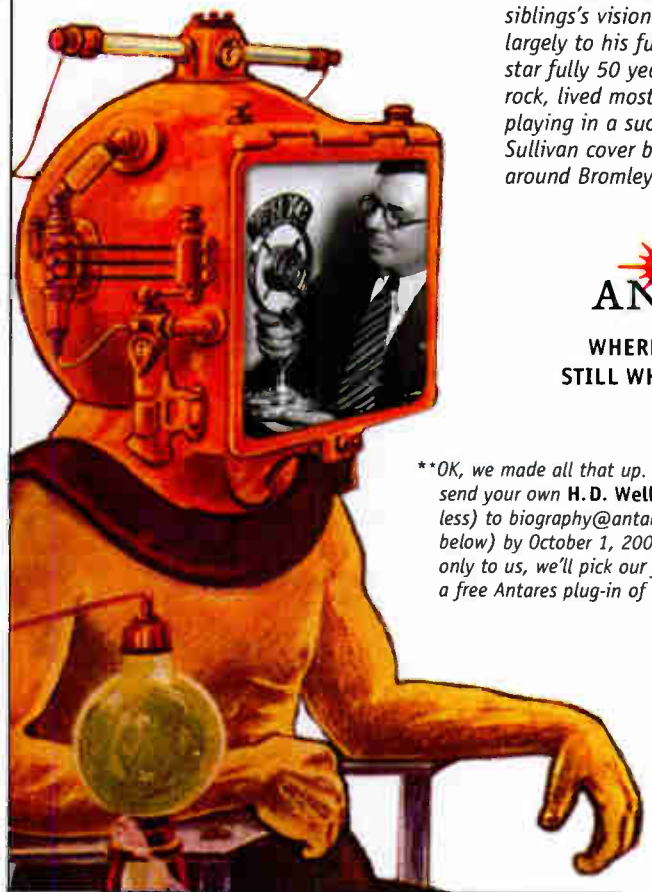

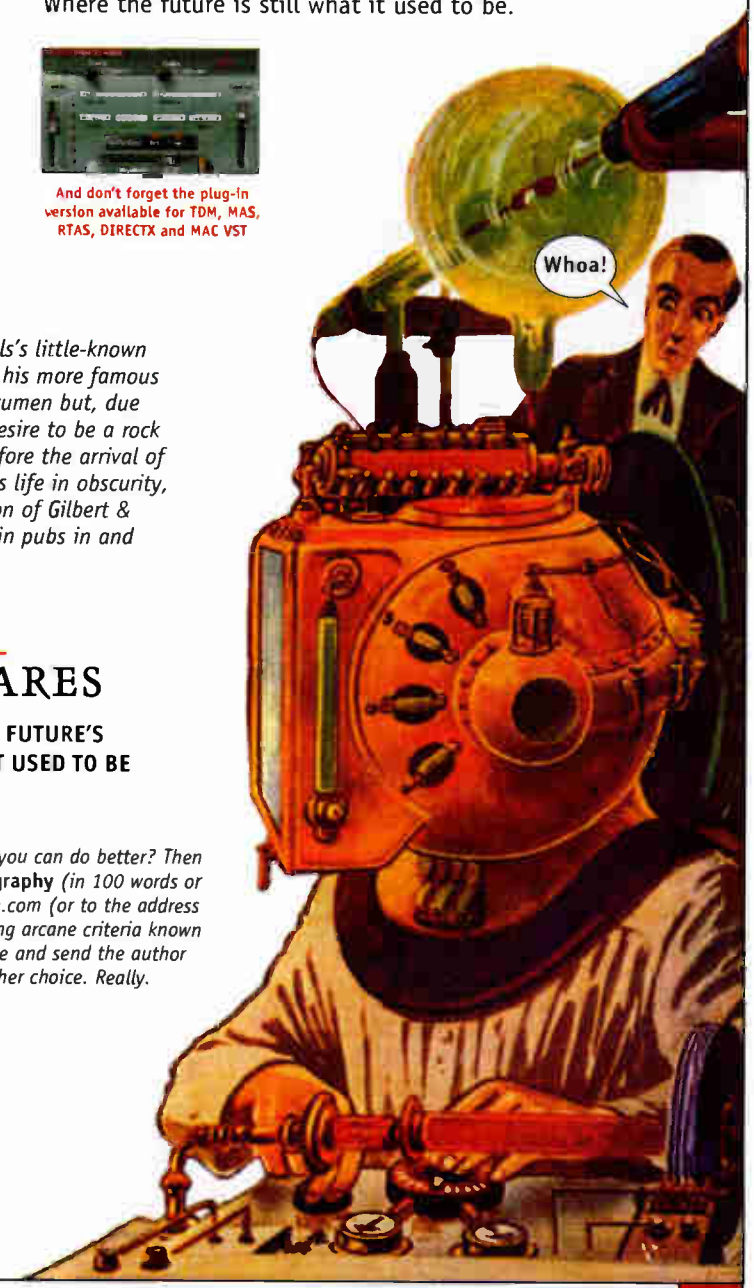

H. D. Wells, *H. G. Wells's little-known older brother, shared his more famous siblings's visionary acumen but, due largely to his futile desire to be a rock star fully 50 years before the arrival of rock, lived most of his life in obscurity, playing in a succession of Gilbert & Sullivan cover bands in pubs in and around Bromley.***

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02

they are listening to, and at the end of the day, the song is still the song.

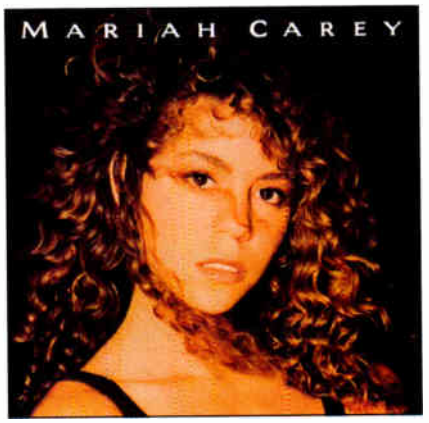
So, the goal is still to find that connection between artist and listener?

To me, the technology doesn't matter. There's going to be a song coming out tomorrow—let's say it's someone like Sarah McLachlan, sitting at the piano playing and singing, and nobody pitched her vocal. Nobody overdubbed her. It's just her and the piano, and it's "Angel," and it's the most beautiful song. It's a huge hit, and at the end of the day, it's about the song. Carlos Santana? I mean, my God, the whole phenomenon of 27 kazillion Grammys and 95 million records sold. Why? Because we've finally decided that the timing is right and that's what's going on this year.

It's kind of like we're all making clothes. I'm Armani, and he's Oscar de la Renta, and over there is Calvin Klein. We're making these outfits for these people to wear. Everybody is wearing black leather pants and black leather jackets. In a week, it's going to be white leather pants and white leather jackets. So what we're doing is making these temporary fads in music. You have your Britney Spears, your Christina Aguilera, your Jessica Simpson and your Mandy Moore. Over on the male side, you have your boy bands—'N Sync and Backstreet Boys and all that. In between you have this white girl who can sing like Mariah Carey, the white boy group trying to sound like Boyz II Men and this Latin artist who yesterday was singing in Spanish, today he's singing in English.

Okay, so it cross-pollinates. It's like one goes into the other that goes into the other, and we have this big wash. The wash comes out with 'N Sync with Gloria Estefan. Okay, great, we're more intelligent for that. We're better people for that. Then Carlos Santana is doing this song with Rob Thomas. Who knew a year ago that this street-y, Latin salsa flavor, kind of edgy, rock-voiced song is going to hit us all so hard that it is going to be the biggest song of the year?

I think it's amazing. It's so wonderful because it gives [something back to] young people and young listeners who don't know better because their headphones are filled 24 hours a day with Limp Bizkit or Britney Spears. Now they become aware of what Latin music is and what a rich history Santana has, and it makes us all more intelligent. I think it's great, because tomorrow we get to come up with a song that has a Latin-based flavor with a boy band



singing in Spanish. We get to choose more colors and styles. It's not just about listening to segregated types of music. We're inventing new music.

Is it difficult to come up with new things for an album you know isn't going to come out for nine months?

It's like time is your worst enemy, because of the new advances in music and technology. If you're going to be in the studio for a year making a record, a year after you started it the first song you did is probably going to be obsolete. During that year four fads would have come and gone.

I think that, again, you just try to believe that a good song is a good song. Sometimes we have to go back and remix things and add a few sparkles that are the flavor-of-the-month sparkles. I worked on an album that is just coming out that we started three years ago. [Lara Fabian] is a Canadian-French girl who is an R&B singer with an amazing voice. She got a huge record deal at Sony Music right around the time that Celine Dion was really big. We went into the studio and we started working on the most beautiful music I've ever had a chance to make. But now we're all sitting around going, "Hmm, that song is now two-and-a-half years old, and it doesn't sound like now." So, we're going back in the studio and redoing some of the stuff.

Are you redoing the whole thing?

Not really, just the colors around the vocals. Her singing is her singing. I'm talking about the sound of drums, the sounds of keyboards. Sometimes just on a musician level, I wouldn't want someone to hear an old patch from an old synthesizer. Maybe that's a cheesy sound now, you know? It's kind of like we're all doctors; we all have to keep up on our medicine journals.

I know that I have to be current and provide the artist with what they really don't know about. I don't really expect Celine or Mariah to come in and say, "Hey, man, I got this great new sound or this great new sample." It's up to your programmers and engineers and everyone in the studio to be really current and to know the cool things. When we were doing the Savage Garden album, Daniel [Jones] and Darren [Hayes] brought with them their current Australian bag of tricks. They said to me, "We like these, but we know this stuff. We want something more." I'm going, "This stuff is awesome." I got caught in a dilemma, because they thought their stuff was old, and I was thinking their stuff was so new that I just want to do that.

So, we sat around the studio and I was hell-bent on creating sounds and loops and things that no one had heard and no one had used. I was betting on it and thinking, "Man, I hope I'm not doing something cheesy or old, because it was really new to me." It gave me this new sort of insight into synths and electronics and stuff that I didn't have before. It opened up some of my creative juices and my technical juices. It was almost like we were sitting at a Moog synthesizer trying to program sounds and squeeze them with filters and all kinds of things. It just resurrected this place that I used to have that got halted because of technology.

And now you're in the studio with more of a folk band, Train. How much of a change is that for you?

Train is five guys that are a pretty standard rock 'n' roll band. Over the past two or three years, these guys have been traveling the world playing their songs and writing new ones. On their own, they've developed their own likes and dislikes.

Pat [Monahan], the lead singer, has taken up playing saxophone, trumpet and vibes, and he's an incredible percussionist. The drummer has developed his own drumming to the point that now he uses some drum machines. So, when we got into the studio, he would say, "This is a good time for me to get my drum machine out. Instead of just playing drums I'd like to do some drum loops." Pat would say, "This is a great time for me to play sax or trumpet or vibes." The sax, trumpet and vibes aren't technologically advanced things, so I was wondering how I was going to put those things in a rock band. That was a big challenge, but it worked out, because if you take that and put it into a computer and chop it up and you do things to it, it sounds incredible. We've come up with a pretty fresh, new take on a very old thing.

How did this collaboration come about?
What happened is that record companies tend to take something that's currently a good thing for them and they milk it. So, apparently because of the Savage Garden thing, Columbia Records looks at Savage Garden as a band, although, in reality, Savage Garden isn't really a band. Columbia said, "You did so good with that band, how about trying it with this band? And not only this band, but what about Aerosmith?" I'm going, "Whoa. Hey, man, this is really good. This is what I've wanted to do for a long time." I know I can do this.

This seems to be a wild shift from just three years ago?
That goes back to your first question about how it feels to win the Grammy. Well, it feels especially good to me, because I didn't do what I had been doing for so many years— you know, the Mariah/Celine/pop-ballad years. It gave me a chance to prove to myself that I don't need Mariah Carey to keep working.

Mariah and I, temporarily I hope, have parted ways. It's not like I was out to prove it, but this was a really strong year for me to go out and prove to myself that I'm not just Mariah Carey's producer or Celine Dion's producer. It was really good because I didn't work with either of those two women this past year. It is a different take on my career.

Now I'm writing songs with a lot of artists. Just the writing of songs is so wonderful because it's not just, "Okay, what ballad do you want to do." No, this is writing, and the writing is setting up the producing, and a lot of this stuff is very diversified.

Well, with Train and with Aerosmith, it's now a matter of talking to five people instead of just one. Do you approach the sessions differently?
Well, it has to be a community thing. I'm coming into a family. I'm not a member of the family, but I'm now asked to join the family in a certain way. What I've learned is that you have to keep their sound. I come in with all my stuff, and I could just overtake their stuff. The power a producer wields in the studio is that you can take away who the band is. A lot of producers might not realize that because they go so far into creating what they want to do with their sound that they are just using the band as their own instruments. I try to be careful.

So, when I'm in the studio with Train I have to say, "I want this to sound like you, unquestionably you." It can't sound like me. What am I gonna make those guys sound like? Mariah Carey? So, there's this balance of keeping the family sounding like they sound, but with my influence and direction and production.

In the past, you've talked a lot about technology and how it's changed things in the studio. Over the past year, has there been a tool that's been interesting or creatively inspiring?
I would say it would have to be having the ease of having the digital workstation. You're not running out of tracks. At the end of the day, you're not wor-

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ried about this little noise over here because you can just go in there and erase it immediately. It makes life easier, it makes life simpler for me, and of course, if there's a really great performance from a singer but it's a little out of tune, we'll pitch it.

All that stuff has made life really, really great for us, but I'm worried about it. I'm worried that we're not making records the way we're supposed to make them. I heard a country song the other day by a really nice woman, and it was a really nice song, but her voice was so completely AutoTuned that it wasn't her voice. Not as much as Cher sounded in "Believe," but almost. For lay persons out there they wouldn't really notice it, but for us musicians and industry guys, we just go, "Oh my God, why did you do that?" It was such a crime to me to hear a beautiful country record with a great country singer, but it wasn't her singing, it was a computer singing for her.

In the old days, it could be argued that the engineer was one of the most important persons at a session. They made the microphones sound right, they set up the rooms, and they did all the behind-the-scenes stuff that made the audio better. Is the programmer almost more important than the engineer is these days?

In some cases, yeah. In some cases, the programmer is now the engineer, because we're not making records on tape anymore. We're not making records through microphones, except for vocals. Everything else is digital-to-digital, straight into the computer, so the programmer has become the engineer.

A few engineers that I work with are looking at the future. It's kind of like driving; you constantly have to be looking in your rear-view mirror as you're looking through the windshield. Some engineers really took it upon themselves to learn where the future is going and they went and they woodshedded and they got their Macintosh computers and they got their Pro Tools. So, you have very smart engineers who can actually go digital or go to tape.

Is it going too fast? Is it getting too widespread? Is it getting to be too many people so that music will become such a cheeseburger industry that it's not even going to be real cheese? I hope not. I still believe that it's all in the song. ■

Freelance writer David John Farinella is a frequent contributor to Mix.

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NASHVILLE

THE WORLD'S MOST ACTIVE STUDIO MARKET

BY DAN DALEY

Nashville has long prided itself on having the largest number of churches per capita in the U.S. So it's appropriate that the city's studio business in the last decade is prefigured in the Bible. In the mid-1990s, Allen Sides and Gary Belz begat Ocean Way/Nashville, and Masterfonics begat The Tracking Room, and Reba begat Starstruck, and many major new facilities were born as country music rose in the pop charts.

At the turn of the century, however, the city flipped pages, from Genesis to the Apocalypse, and all hell broke loose. The worldwide business trend of consolidation began to affect Nashville. It started with the record labels, and several closed their doors. That, in turn, had impact on the studio base, which had benefited from the attention Nashville had received during country's golden years between 1990 and 1995 when more non-country artists than ever came to record in Nashville and its environs. The studio business, nonetheless, remained dependent on country for a primary source of clients and revenue. It wasn't long before consolidation began to cull the swollen number of Nashville facilities.

Some of the most prominent transactions provide a sense of scale. In 1997, as the first effects of label budget and roster cuts began to be felt, Nashville started to lose upper-tier studios. Sixteenth Avenue Sound, one of only two SSL G-Plus facilities in the city, shuttered that year. Closings continued for the next two years, with Nashville losing Music Mill and Zomba-owned Battery Studios.

In early 1999, a wave of mergers and acquisitions began and is only now beginning to slacken. Seventeen Grand bought the assets of Love Shack. Emerald Sound Studios purchased the assets of Masterfonics, which had sought bankruptcy protection the year before. Emerald owner Dale Moore also acquired the businesses of the Workstation and created a joint venture studio called the Parlor. Gary Belz purchased the SSL 9000 J-equipped East Iris Studios, not long after Moore had attempted to do the same. Lou Gonzales, owner of Quad Studios in New York City, bought the serendipitously named Quad Recording in Nashville.

These examples illustrate the forces and the strategies at work in Nashville at the moment and reflect the situation facing the studio industry at large.

EMERALD'S ISLE

Emerald's tale is most complex. Since owner Moore returned to Nashville full-time after developing and selling a string of radio stations in Montana, he has dramatically changed the studio business landscape through a series of acquisitions. Moore bought a one-room facility from producers David Malloy and Even Stevens in 1985, and he had kept it out of the Nashville studio "arms race" of the mid-1990s. So when Moore sold his radio holdings, he had capital at a time when much of Nashville's studio owners were in debt. Moore's Emerald acquisitions now include eight studios in four buildings in a single city, and it's the largest studio complex in the Southeast, rivaling in size Ocean Way in Los Angeles, Chicago Recording Co. in Chicago and Hit Factory in New York City.

But perhaps more important than mere size, Moore and former Masterfonics partner and Emerald studio manager Milan Bogdan (who left Emerald ear-

Sound Kitchen Studios with owners John (seated) and Dino Elefante

PHOTO: JACKSON GOFF

From top clockwise: Starstruck Studios' SSL 9000 control room for the Gallery, the Gallery recording room, the TV soundstage and the TV control room

lier this year and is now working for Nashville/New York-based Quad Studios) oversaw functional and business expansions. Emerald has created new businesses within the organization, including a direct-to-satellite radio promotional service, a Webcasting service, a digital audio post-production venture, a talent agency, and a marketing division, which seeks to match corporate sponsorships with artists and record labels. Emerald has also introduced a tiered pricing structure in which unit costs for studio time decrease as the number of services used within the Emerald system increases.

"There was a tremendous opportunity in Nashville at that time, and there still is," says Moore. "We felt that the consolidation that was going on made sense from a business point of view. The city had been overbuilt. But the opportunity that we created was to acquire properties that would allow us to close the circle and offer a range of services within one company that clients used to have to go to several facilities for. An entire project—from tracking to overdubs to digital editing to mixing, mastering, video post-production and post-production business services like radio and Internet promotion and artist bookings—could be handled [in one enterprise]. And that brought economies of scale to the record-making process that were very appropriate for the way the record industry was going."

Moore refers to the fact that, while country music as a genre had taken a nosedive in recent years, the larger music industry was consolidating. Multibillion-dollar transactions, such as Seagram's acquisition of Universal and PolyGram, have been followed by huge cost-cutting exercises resulting in layoffs and album budget cuts. "What we were offering the record industry at that moment was just what it was looking for," Moore says.

Emerald has most recently focused on upgrading their technology. The studio installed Nashville's first Euphonix System 5 digital console in mid-March.

Moore acknowledges that he is taking a chance introducing such a radically new console platform to Nashville. The area tends to be staunchly conservative in terms of boards, because the nature of country music production tends to favor fast completion of projects, and engineers—who move daily between studios—want consoles they already know.

"That's the way it's always been in Nashville," says Moore. "I know—we took a chance by putting in an SSL E Series console back in 1985 when everyone here was working on Neves. And we now have to do the same thing as we did then: educate the engineering community here about the console and why we think we made the right decision."

Moore says he polled Nashville area producers and engineers about the console, which was introduced at the 1999 AES Show in New York City. He also had Euphonix put the console into the studio for a period of time prior to finalizing the sale so engineers could preview it in situ.

"When you put in a piece of equipment like this, you're selling to a group of people—record labels, artists, producers, engineers," Moore says. "The mixing engineer especially has considerable influence over where mixes get done. You want to get as many of them to check the console out as possible. So there's both a technical and a marketing decision that has to be made."

The Euphonix System 5 room at Emerald Sound Studios

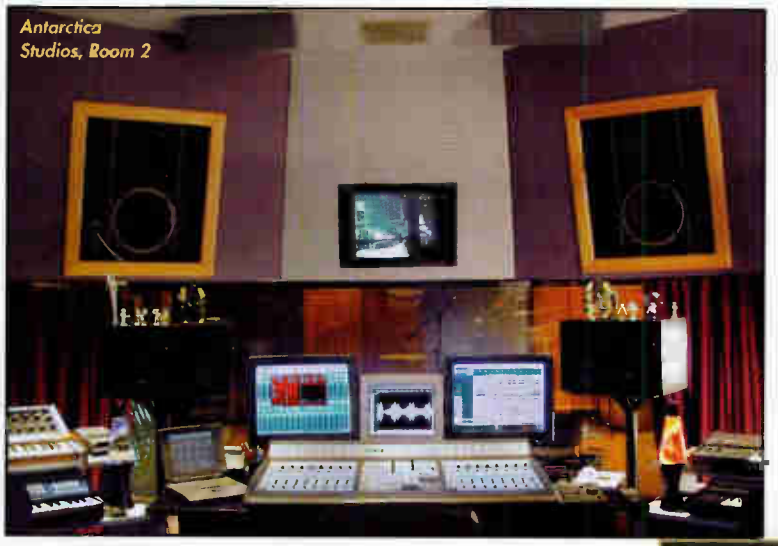
PHOTO: RON NEILSON

Moore also says he is hiring a dedicated assistant for the Euphonix room, and that Emerald employees will be trained by Euphonix. No rates have yet been set for the newly outfitted Mix Room at Emerald. Moore says, however, that he is likely to go with an introductory type of rate for the first several months, and he expects to increase that rate after the console gains some traction in the market.

The Castle Recording Studios

THE SHIFTING STUDIO SCENE

Starstruck Studios also beefed up its broadcast services in the last year. The facility, part of the multifaceted Starstruck Enterprises group owned by singer Reba McEntire and her manager/husband Narvel Blackstock, has two SSL 9000 J-equipped studios. But what started as a relatively small audio media promotional services two years ago expanded in 1999 to encompass video, and now both *Access Hollywood* and *Entertainment Tonight* take regular Nashville feeds from Starstruck, routed straight to Burbank, Calif., via satellite transmissions and fiber-optic connections.



Antarctica Studios, Room 2

Studio vice president Robert De La Garza declined to discuss rate comparisons between the studio and the broadcast operation, but did note that the margins on the broadcast services were higher than those in music. This year, the broadcast division, which De La Garza heads, has expanded its marketing efforts into the medical industry, corporate narrowcasts and book publishers sending authors on electronic media tours. "It's another service that we can offer clients who use the studio, because they'll need to promote the records they make here," he explains. Looking further ahead, De La Garza says that the studio has been wired for 75 ohms for high-definition broadcasts.

Other facilities in Nashville have realized that the business model is changing. Seventeen Grand has staked out a leading position in the Nashville and national market as a surround mixing facility, and the studio did a dozen surround projects in 1999. The facility also bought the midscale Love Shack facility in order to broaden its client base. "It's given us a more stable cash flow situation, because we can provide services for more clients," explains Seventeen Grand co-owner Jake Nicely. "Love Shack lets people come in at a lower rate level and start projects, or use the room for affordable overdubs, then come back to the main studio for mixing or surround work. It's a wider range of services people can access."

The same principle drove Sound Stage owner Ron Kerr to expand into the former Nightingale Studios. "That location gave us access to a new client type—the upper mid-level client," says

Seventeen Grand Studios

The SSL Axiom-MT at Back Stage Sound Stage Studios

Sound Stage studio manager Michael Koreiba. "It filled a hole in our range of services and also addressed a hole in the market. We've found that there are a lot of clients out there who are in the market for a good studio in the $800- to $1,200-a-day range."

That market niche, Koreiba continues, is a potentially large one. Its ranks have grown with both major-label, first-record artists who might have had larger budgets during country's headier days a few years ago, and by rock, Christian and alternative artists working on mid-career records.

Sound Stage also made other service moves, including the establishment a format transfer service, which Koreiba says is bringing work in on a national basis. The facility also formed a joint venture deal with engineer/mixer Chuck Ainlay: The partners

PEOPLE HAVE GOTTEN USED TO RUNNING OUT TO WAL-MART WHEN THEY NEED SOMETHING. THEY CAN FIND EVERYTHING THEY NEED THERE UNDER ONE ROOF. THAT SAME CONCEPT IS NOW BEING APPLIED TO THE STUDIO BUSINESS. —*MICHAEL KOREIBA*

have created a new studio called Back Stage, equipped with an SSL Axiom-MT digital console.

All agree that the studio industry is changing dramatically in the wake of new technologies and business models sparked by the Internet, and they concur that bigger seems to be better. The ability to provide new services within a vertical organization is a valid strategy for surviving in a changing landscape. "People have gotten used to running out to Wal-Mart when they need something. They can find everything they need there under one roof," says Koreiba. "That same concept is now being applied to the studio business. You just have to decide which services your market needs, and how many services you can supply and do it well without overstressing the business. And that might be the art of it right there."

Still, some of Nashville's changes are unique to the city, Nicely says. "[Nashville] still basically relies on what's in its backyard, and that's been country up till this point," he says. "But even if that continues to be the case, it's whatever country happens to be that could affect things. Right now, it's crossing over heavily into pop, with records like Faith Hill's 'This Kiss.'

"But more than what country becomes, when it was hot, it attracted a lot of people to Nashville, and some of them are having an effect on the city," Nicely continues. "People like [producer] Dann Huff, who produced Faith's record and who has another pop hit with Lonestar. People like him are part of the reason that country is crossing over the way it is right now. Dave Thoener, who won a Grammy this year [engineering for Carlos Santana's "Smooth"]. Adrian Belew lives in Mt. Juliet [a Nashville suburb], and we did part of the last King Crimson record here. Country music as we knew it growing up—the Don Williams and Conway Twitty country—will probably become a small niche market, like bluegrass. But the part that's becoming like pop music and the people who are leading it that way all use the facilities here."

COUNTRY MUSIC AS WE KNEW IT GROWING UP—THE DON WILLIAMS AND CONWAY TWITTY COUNTRY—WILL PROBABLY BECOME A SMALL NICHE MARKET, LIKE BLUEGRASS. BUT THE PART THAT'S BECOMING LIKE POP MUSIC AND THE PEOPLE WHO ARE LEADING IT THAT WAY ALL USE THE FACILITIES HERE. —*JAKE NICELY*

THE NEW MIDDLE CLASS

If there has been significant activity in the upper tier of facilities, the same goes for the emerging middle class in Nashville's studio community. Antarctica, a Pro Tools-based recording studio that also offers graphics and Web page construction services, underscores how new business models are rising from the ashes of the old. The studio moved into the site of the former Sixteenth Avenue Sound, and owner John Trevethan says he purposely targeted a middle ground in the Nashville market precisely because there was so much consolidation activity above. "There's a lot of high-end competition here, but that made for opportunities in the middle level," he explains. "Also, the Pro Tools thing in Nashville had been mainly for editing. We created something new by making it a primary recording system. This is a level of the market that's really been overlooked."

Trevethan says he has no ambitions to grow into the bigger leagues. He notes that Nashville's music market has become more diverse and more technically oriented and is now less reliant on large consoles and big tracking rooms. "To quote Robert Fripp [who recently gave an online Webchat, hosted by Antarctica], the small mobile unit is the way to go in the future," says Trevethan.

New Yorkers "Void" Caprio and Keith Spacek saw the potential in Nashville's underground rock and pop scene, which has been oft-discovered but rarely leveraged with success. Caprio and Spacek decided to open a studio that could provide them with a base for developing productions with local bands and built most of the single-control-room facility themselves. The result, InterZone, has three sizable recording spaces with 12-foot ceilings and hardwood floors, and the equipment includes a Mackie 8-bus console and a vintage 3M 2-inch 24-track, along with three 20-bit Alesis ADATs.

Caprio believes InterZone can be a successful hybrid facility: It houses the partners' music production work and Caprio's music library productions, and it is available for hire at between $300 and $500 per day. InterZone has also built in several of the services that are becoming a hallmark of these kinds of facilities, including on-site CD-R duplication and Internet promotion.

IN THE BURGEONING 'BURBS

The other story in Nashville isn't in Nashville at all. It's in Williamson County, Tennessee's affluent suburb, about 16 miles from Music Row. Several facilities, old and new, have been thriving in Williamson County, partly because the neighborhood doesn't carry the implicit cultural connotations of country music the way Nashville does, and partly because many of country's success stories have moved to the South's affluent equivalent of Fairfield or Orange Counties.

In Franklin, the genteel, antebellum county seat of Williamson County, the landscape is now dotted with several facilities that are thriving. The most notable is Sound Kitchen, which has grown from two rooms in 1994 to six studios today, with two more under consideration by co-owners John and Dino Elefante. John is a successful Contemporary Christian recording artist and former lead singer with the band Kansas, and Dino is a prolific producer of Christian records and the senior vice president of Pamplin Records in Portland, Ore., and the pair had originally predicated the studios' revenues largely on their own work.

Dino says that's changed considerably in the intervening years. He also estimates that as much as 25% of the recording in the area is now being done in Williamson County at Sound Kitchen, Dark Horse, The Castle and a handful of other facilities that are near the upscale homes of producers and artists

who don't want to drive to Music Row every day.

"We had a gut instinct about [the area]," says Dino. The Elefantes backed up that intuition with a business approach that focuses on proven and widely accepted equipment choices. The Sound Kitchen console complement includes new and pre-owned Neve VRs and SSL G-Plus desks, and the newest, largest room sports an API console. The Elefantes have also taken great pains to cultivate business relationships with area producers, offering them what Dino Elefante describes as "time shares" in the facility, an arrangement that guarantees availability and rates in return for consistent use. "It's a form of buying into a studio, but without the liability," Elefante explains. "It's a time-share mentality."

Franklin's other successful facilities include Dark Horse Recording, which is based at owner Robin Crow's home. Crow has a theory about why people record in the area: They work there because they live there.

Now that population makes up more than half the bookings for Dark Horse, and the studio has grown from a private single-room studio to a three-room facility. Much of its work comes from the still-growing Contemporary Christian recording market. Several Christian record labels have set up shop in the Maryland Farms office park in northern Williamson County, and artists and producers seem to like the suburban setting.

In addition, Crow says that, at the moment, two of his three studios are booked with clients from outside of Nashville. "To some degree, we're able to float above what's been going on closer to town," he says. "But there's a price for that—we never stop spending money on upgrades."

At the Castle Studios, owner Jozef Nuyens is more skeptical about the suburbs' ability to remain aloof from the developments on Music Row. "I don't think you can separate [Williamson County studios] from the Row," says Nuyens. "The business affects us all the same way. It's just that out here, we have a better image appeal than the Row. The studios aren't necessarily better, but the settings are. Overall, though, we've all been affected by what's been going on. I don't know that the mega-studios are going to change things all that much. The fluctuations in the business here are easing. When it's all said and done, things will be calmer but at a lower level than they were."

Nuyens has hedged against that by increasing his in-house production activity and pursuing music publishing interests. Last year, he concluded a joint venture with Warner Chappell Music.

THE FUTURE

Nashville is churning. But most say it's for the better. For example, new Internet-based companies have cropped up such as Tappedinto.com, an online music venture co-developed by Preston Sullivan, the former Sixteenth Avenue Studios manager, and Judith Newby, former personal manager for Everly Brothers, Tom. T. Hall and Johnny Rodriguez. Tappedinto.com might prove to be the model for the future of multimedia in Nashville, a model in which music becomes a content source for the 144 URL channels Tappedinto.com operates. The company also creates marketing and sales packages for independent and major label artists and its own burgeoning roster of recording artists.

Tappedinto.com's audio arsenal is Spartan—a Mackie mixer, a few microphones, Real Audio for MP3 encoding and Adobe Premiere video editing software. But that's about all it takes, Sullivan says. The company can always use the studio resources of Nashville, which continue to become more affordable as consolidation continues, as well as Full Scale, a Seattle recording studio that is one of Tappedinto.com's partners.

Nashville has also become the North American headquarters for the sprawling School of Audio Engineering (SAE) empire. SAE took over the former Arista Records building just off Music Row, and the 14,000-square-foot facility is now the flagship for the school's invasion of U.S. shores, which began last year.

There is much that is unique in Nashville's situation. But there is just as much here that can be applied to the larger studio business picture. Although The Hit Factory's acquisition of Miami's Criteria has been a headline-maker, Emerald's business plan has been just as compelling, in a more complex and nuanced way. Perhaps the most important lesson of the last decade is the notion that, for the first time in its 50-plus years as a recording center, Nashville's developments in its studio infrastructure and the developments in country music may not be one and the same. ■

A DAW GROWS IN NASHVILLE

MARK MILLER AND BRIAN TANKERSLEY'S GBT STUDIO

PHOTO: WENDELL MC GURK

Mark Miller (left) and Brian Tankersley in GBT's control room. In place of a conventional mixer, the room features a custom digital console comprising five PARIS fader banks, with four 20-inch Sony monitors displaying all console parameters.

BY GARY ESKOW

Its Grand Ole image may keep outsiders from seeing Nashville as a center of technological advancement, but there's plenty of forward thinking going on in Music City. One recent example of this is GBT Studio, the private enclave (and initials) of producer/engineer Brian Tankersley and Sawyer Brown lead singer Mark Miller. As we spoke, the final touches were being applied to their new facility, based around what Tankersley says is the "largest digital audio workstation on the planet." And at 96 tracks, 120 analog and 60 digital inputs, it just might be.

A native of Houston, Tankersley migrated to California years ago. "I worked in L.A. for much of the '80s, and it's an exciting place, but in 1990 my wife and I wanted to live somewhere that was more conducive to raising our family, and we headed to Nashville." With no experience in the country field, Tankersley needed a break, and he caught one when his friend Scott Hendricks asked him to execute the dance remix of "Boot Scootin' Boogie," by the then-little-known duo Brooks & Dunn. "That record went through the roof, and the album with the original version of the track sold more than 5 million units. Our mix became so popular that it was included as a bonus cut on their second CD. I was very fortunate to work on 'Boot Scootin' Boogie,' because it put me front and center as a country mixer."

During the past two decades, Tankersley has worked on nearly every major console and tape system on the market. But in place of a traditional board and either analog or digital tape recorders, GBT Studio sports a huge E-mu/Ensoniq PARIS workstation.

"Back in November of '97, I was exposed to the then-brand-new PARIS system," Tankersley recalls. "It used an early software revision, and I wasn't convinced it could be integrated into a professional scenario. About a year later, PARIS had developed to the point where it could do what I needed to make records. I purchased PARIS expecting to use it as a utility device, principally for vocal comping, but I was shocked at how good it sounded, and sound is everything to me." During the past year, Tankersley has been co-producer/engineer/mixer on Lonestar's Number One single "Amazed," which was mixed in PARIS, and Newsong's Number One hit "Can't Keep a Good Man Down," which was done entirely within the system.

Disk-based delivery formats can be a thorny issue when you store mixes on a workstation that's not ubiquitous. When he began executing final mixes in PARIS, Tankersley often carted a pared-down system to a local mastering room, and he's toyed with the idea of leaving one in such a facility on a semipermanent basis. Currently, 24-bit masters are delivered on Tascam DA-45HR DATs. "I'd rather cut out going from the computer to tape—any device that involves a physical tape transport brings its own internal and external clocking issues into the process,"

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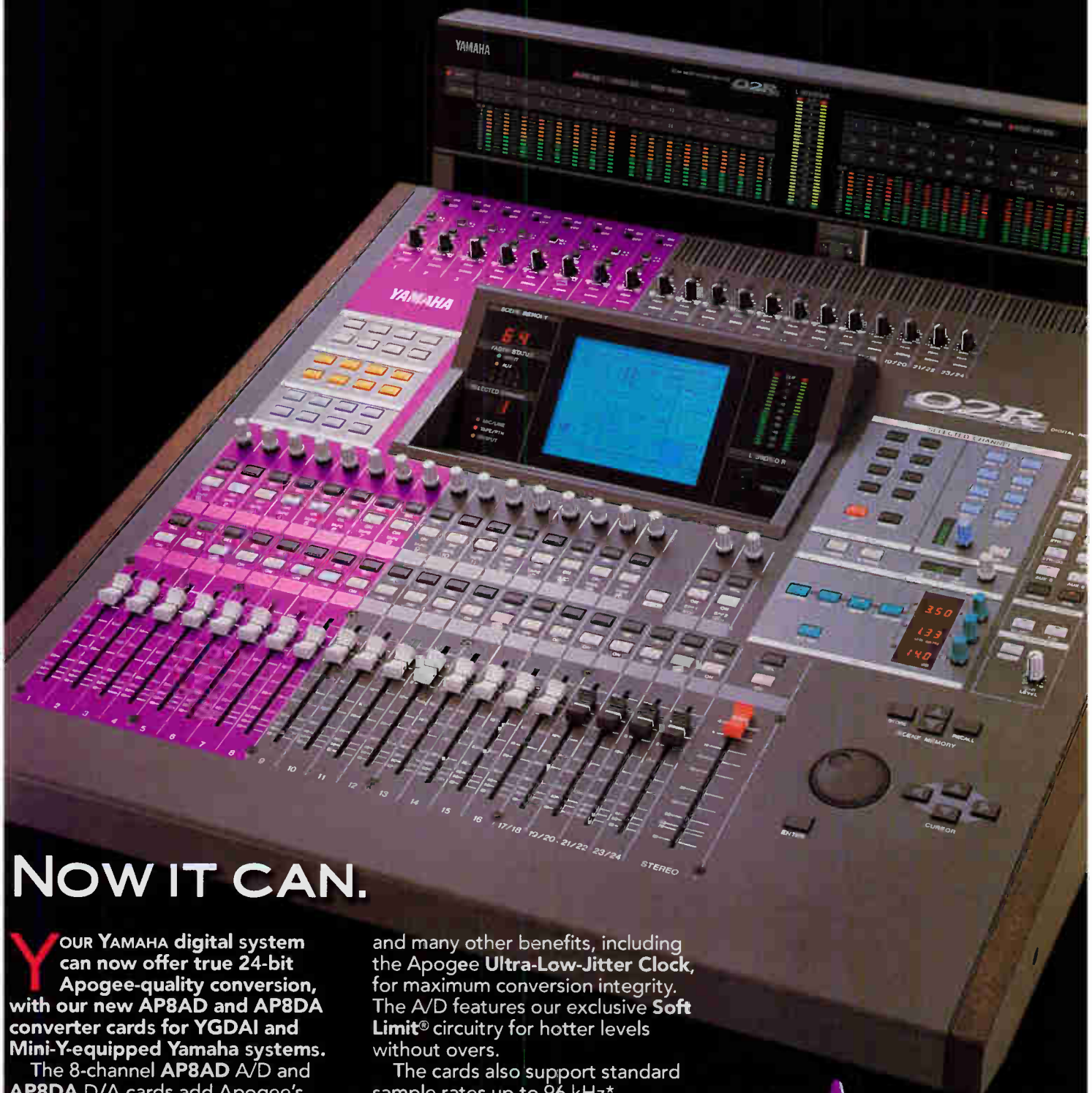

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Tankersley explains. "So far, we've suffered no problems dropping to 24-bit DATs, but why introduce another variable? If I can go directly from my DAW into their system, I bypass any jitter that might be caused by a DAT transport, for example."

Ratcheting up his personal studio became the only way to go when Tankersley found that more and more of his clients were asking to track as well as mix on PARIS. Among them was Sawyer Brown's lead singer Mark Miller. After snagging the Grand Prize on the *Star Search* television program—and the $100,000 that went with it—Sawyer Brown was signed by Curb Records. They've turned out 17 albums for the label, with hits that include "Some Girls Do," "The Race Is On" and "The Walk." Due out this summer is the band's latest CD, *Sawyer Brown Live*, produced by Miller and Tankersley.

"Brian handled a couple of dance mixes for us, and I was blown away by the sound, so I came over to his place and I was amazed at the speed at which he was trying out different ideas working on PARIS," says Miller, who has his own 48-track project room with

BRIAN TANKERSLEY ON THE GBT SYSTEM

A major benefit of any DAW is full reset/recall capability. I wanted to extend that concept to tracking, cue mix and overdub scenarios in addition to the obvious mixing application. This 96-track PARIS system has 120 analog inputs, 72 analog outputs and 60 digital I/Os directly into the DAW with no external console. The CPU is a Kryotech SuperG running a 1GHz Athlon, with more than 1 Terabyte of hard disk on-site in removable trays. Everything and everybody talks straight to the DAW. PARIS allows infinite storing and naming of setups for its virtual patchbay and recalls all settings including +4/-10 dB levels for each analog input. With a little forethought, full reset of any session—excluding analog preamp, EQ and compressor settings—is possible.

Seven Yamaha 01V mixers in conjunction with Frontier Tango 24 A/D & D/A converters make up the cue system. The Tango has Lightpipe in, out and, most importantly, a reclocked thru output, so 16 channels of Lightpipe, originating in PARIS, are fed all the way around the room from Tango to Tango, which are set up in pairs. The 16 analog outs of each pair are fed to an 01V. Opto-isolation means no grounding issues, and the short, balanced analog run from a dedicated 24-bit analog out to each 01V input results in excellent fidelity whether the player monitors via speaker or headphones. I would pit it against any cue system I've heard. Using Emagic's Soundiver, I have complete control and recall of the cue system from the console between PARIS' patchbay and 01V MIDI control.

The Lightpipe outputs from the Tango's A/D converters, which are switchable to +4/-10, are used as line inputs to PARIS for keys, samplers or electronic drums. I've always been bothered by the way those -10dB, semipro line level devices made their way to the console. Goodbye to cheesy keyboard line mixers and/or direct boxes; say hello to 5 feet of cable to 24-bit A/D nearly anywhere in the room. It does make a difference.

Each of the three player stations in the control room is an open, 8-foot-wide cubbyhole facing the console, treated on all three sides and the ceiling with 3-inch Auralex Studiofoam, looking a bit like the transporter on *Star Trek*. Tannoy near-fields on adjustable arms attached to rails on the ceiling can be positioned for proper stereo image while being relatively close to the player. Putting the near-fields close to the players provides them with an in-your-face playing experience, while reducing the overall levels in the control room.

The console was custom-built by Todd Beeton of Studio Supply & Construction to house the four Sony 24-inch Trinitron monitors and 96 faders on six C-16 controllers dedicated to PARIS, as well as the 18-inch flat panels used by the ancillary computers. Three additional computers handle Gigasampler, Acid, Logic Audio, Soundiver and various other soft-synths. All are Lightpiped directly into PARIS: 64 channels in all. There are other variations from the norm that we've incorporated, but the final musical result is what matters. We feel a bit more creative and have a bit more fun making music this way.

—Brian Tankersley

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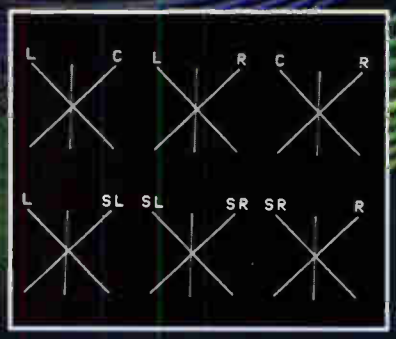

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CIRCLE #051 ON PRODUCT INFO CARD

a Neve console. "I've also started projects in my place and thrown them into PARIS, and there's absolutely no sound coloration added. It sounds like great analog technology."

GBT Studio blends a traditional approach with new technology. "We decided to build a large control room, one that could handle as many people as was humanly possible: Ours is a 20x30-foot space. Inside are three separate workstations, each acoustically treated on three sides with acoustic foam for absorption. Players at these stations face the console, and they have the option of putting on headphones if they want to. On the other hand, we have a pair of boom stands hanging upside down approximately 12 to 18 inches from their face, and a subwoofer in the back of their chair in case a player wants to monitor without using phones.

"Why have a bunch of iso booths when half of them are used for guitars and Leslies?" he continues. "We built three iso booths that aren't visually accessible from the control room, designed to have an acoustical space for a guitar cabinet, live drums, or some other high-SPL piece of equipment [rather than a guitar that might be tracked directly to PARIS, for example], which would bleed too extensively to be appropriate for the control room. Fundamentally, though, we're going to have players in the room with us for most of the tracking, to maximize the human interaction. We'll be able to sit there and get a vibe going, while we're tracking directly to DAW."

PARIS also offered other amenities to Tankersley. "I demand a discrete fader per track, just like I'd have on an analog board," he explains. "I use four 24-inch Sony monitors. Together, these let me look at 64-channel strips at a width onscreen that compares with what you'd see if you were using a Neve VR." Additionally, the recording system runs on a single PC with a fast 1GHz Athlon processor offering ample native processing power. "As a test, I pulled up 59 Waves Renaissance EQ modules and applied them randomly to tracks," Tankersley notes, adding that he typically buses signals in and out of his computer, eschewing the logic that says all functionality must reside inside one box. "The system has eight stereo aux sends. Nothing prevents me from using a Lexicon 480, TC M5000 or M6000, or any of the other outboard devices we own."

Tankersley does, however, have a PARIS wish list. "Grouping and linking faders within the onscreen mixer would be a big improvement, and I hope the 3.0 software that's under development includes this, and my hat goes off to Digidesign for the way that Pro Tools 5 implements MIDI. I'm sure that the integration of MIDI within PARIS will improve over time."

If the idea of combining traditional methods with modern workstation technology is to work, the players will have to buy into Tankersley's concept. How's it going so far? "Everyone has a great time! With 96 tracks available, we often comp rhythm takes with all of us playing to a click track," he explains. "First we'll print a pass live, and then do several more. When we've covered all sections of a tune with good performances, we play back all the various passes. Everyone picks out sections of the different takes that they like best from their individual performances. I then comp an entire rhythm section on the spot. Players get further into the session headspace because they're more involved with the creative process. Being able to yell at each other across the room and achieve a common spirit is the goal of our operation." ■

Do You Know What's Happening In The Audio Market Today?

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LEARN THE LAWS OF PHYSICS

AN ODE TO ENGINEERING

Some things just aren't right. Take, for instance, canned orange juice. Someone should really put a stop to that. Another evil that simply will not go away is lying with numbers. Okay, I guess I mean "stretching the truth" with numbers. Now, we all know that a sufficiently motivated person can make any statistic look good to the uninformed. Even I have been known to embellish concepts a bit—all for the greater good, I assure you.

Here's what I'm talking about. All the new electronic gear, audio and otherwise, that you find in the marketplace is digital, with analog mostly relegated to the vintage or boutique buyer. From the Lightpipe-equipped low end for the DIY musician to the stuff sporting a MADI spigot and hefty price tag, it's digital. And never has there been so much hype about so little.

ILLUSTRATION: TIM GLEASON

Let's suppose that you're in the market for some new equipment. Who isn't, after all, always lusting after the shiny and new? Or, let's say that you want to become more informed about your chosen vocation. No, not playing scorching leads on your new Tele, Bubba—being an "engineer." Of course, the audio industry has its own reality distortion field whereby most so-called engineers have never designed a single tool/engine/device. Does that mean I'm an automotive engineer because I can *operate* one? Not quite. As you probably know, the engineer title we share with other, more technical people is derived from a time in the distant past when poodles roamed the earth unfettered and we actually had to build and maintain our equipment. These days, though, all you have to do is head over to Sammy's Sound Shack, fork over the plastic and walk away with your dream box of choice, without a solitary shred of knowledge about how, internally, said dream box performs its miracles.

Anyway, lots of products at Sammy's are sold as x-number of bits or such-and-such a sample rate, but that really doesn't tell you much. The truth is, as always, not black and white, but numerous shades of gray. In general, all digital gear has the same basic advantages: good multigenerational noise and distortion performance with high amplitude signal, theoretically perfect archival longevity and an ever-increasing price/performance ratio. For now, let's look at that first, distinctive attribute, the one that's fundamentally different from analog. That "perfect sound forever" thing.

A device that has a 24-bit I/O can be advertised as a 24-bit product. But wait, isn't the AES/EBU standard *defined* as having a 24-bit payload or essence? Yup, for as long as my pea brain can remember. Needless to say, the I/O word length has nothing to do with what happens to the data once it's inside the box. With even the fanciest gear, you could have accidentally set the output word length to truncate to 10 bits with no dither and the AES/EBU output would still be a 24-bit output. Only the first ten most significant bits would carry any useful information, though. And, my, how bad it would sound.

Sample rate specs are also suspect, though less so. All things being equal, a product that operates at 96 kHz should have wider unity gain bandwidth than that same product operating at 48 kHz. Well, so what? I certainly can't hear a sine wave above 20 kHz! But is that all there is to our sense of hearing? I can't say with authority that the increased bandwidth alone "sounds better," but I can say that my ears tell me a well-designed piece of gear sounds better operating at 176.4 kHz than it does at 44.1 kHz. Theory tells us that it should exhibit less group delay or phase distortion when operating at higher sample rates, but no one knows the true reason or even if the "sounds better" effect is statistically significant.

Okay, how about word length? That parameter is, in some ways, more obvious and yet more obscure. Our hearing has, on a good day, about 120 dB, or 20 bits' worth, of dynamic range. In the past, we've gotten along just fine with analog tape that had, on a good day, half that dynamic range. Of course, double-ended noise re-

BY OLIVER MASCIAROTTE

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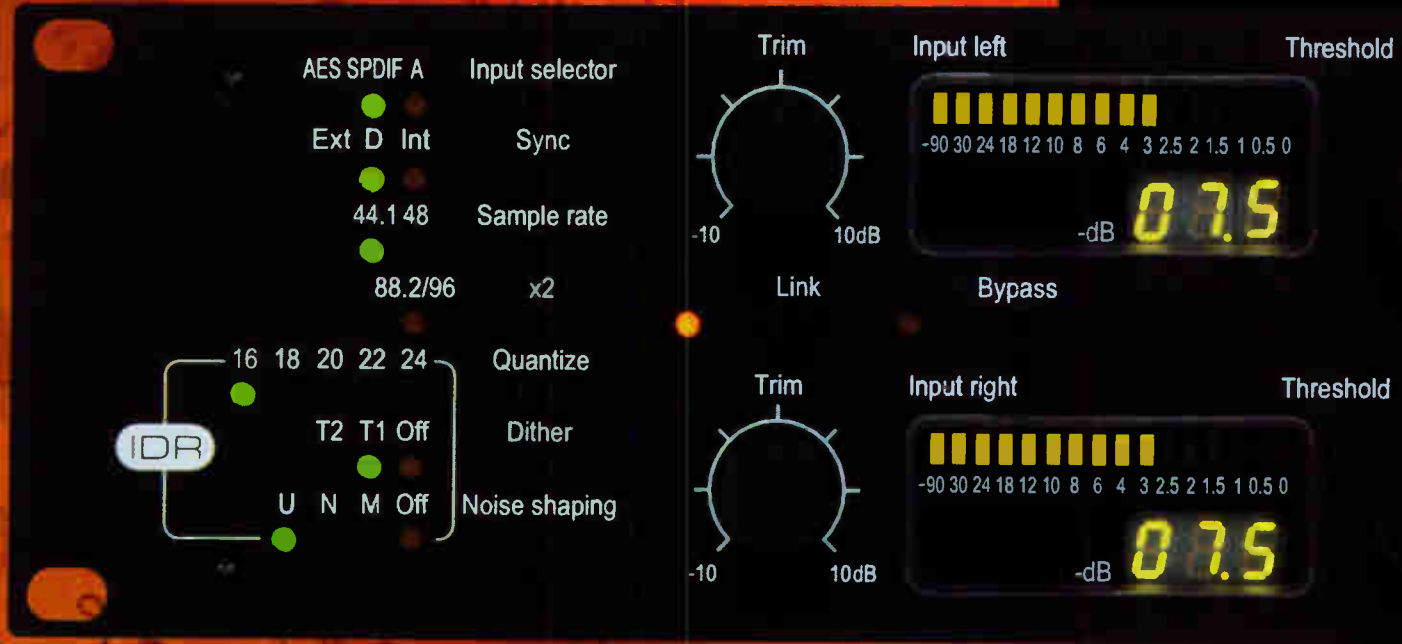

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duction addresses that shortcoming, but why do we need 144 dB of dynamic range in the AES essence if we can only hear 120?

It's those doggone numbers. A minimalist recording—say, a low-noise analog source feeding a high-quality converter and released, unedited, to the consumer—wouldn't need more than 16 bits to convey the information reasonably. Most music, however, isn't produced that simply. Even classical releases, those pristine records of acoustic events, are usually edited so aggressively that making 1,000, 2,000 or even 3,000 edits in an hour-long performance is not unusual. So? In the digital world, almost any process performed on the data, whether it's editing, EQ, gain changes or mixing, results in longer word length data than what you had when you started; 6x6=36. A one-digit number times a one-digit number equals a two-digit number. The same is true with AES data: You make your 16-bit recording 1 dB louder and, boom, you've got some extralow-order bits filled with "the remainder," as my grade-school math teacher called it. You need

NEWS BYTES

MACWORLD EXPO THIS MONTH

MACWORLD Conference & Expo/New York 2000 is happening July 18-21, at the Jacob K. Javits Center in New York City. In addition to plenty of exhibits, seminars and forums, the convention now features expanded special interest areas, including the new Music and Audio showcase, featuring the latest Mac tools for music and audio creation, production, and processing; mastering; CD authoring; MP3 publishing; and networking. There will also be celebrity concerts held every day in the Music and Audio interest area. Visit www.macworldexpo.com.

CYCLING '74 ACQUIRES MAX

Cycling '74 announced the conclusion of an agreement with Opcode Systems (a subsidiary of Gibson) and the French music research institute IRCAM, in which Cycling '74 acquired the publishing rights to the MAX graphical interactive programming environment for real-time music and multimedia.

MAX was originally developed at IRCAM in the late 1980s and was licensed to Opcode Systems in 1990, where future Cycling '74 founder David Zicarelli then worked on development. Cycling '74 has extended and complemented MAX's MIDI and multimedia support with MSP, a set of synthesis and signal processing extensions. The company has announced plans for a Windows release of MAX, later this year. For more information, visit www.cycling74.com.

PLUG.IN IN JULY

The fifth annual Plug.In online music forum is taking place this month, from July 24-25 at the Sheraton Hotel and Towers in New York City. The show focuses on business issues facing the music industry, and examines new technologies and trends. For program details, visit www.jup.com/events/. ■

extra "headroom," as it used to be called in the analog days, to allow for the vagaries of day-to-day production. A 24-input digital desk needs to pad any AES input by 18 dB immediately just to maintain a reasonable gain structure for downstream processing and summing.

And that's not all. Noise is usually spec'd as an absolute noise voltage or indirectly as a signal-to-noise ratio. Very rarely are any specs released that refer to the nature of the noise—its spectral makeup, its amplitude vs. frequency or whether or not it's correlated with the signal. That last noise characteristic can be particularly annoying and comes into sharp focus when lossy codecs are involved.

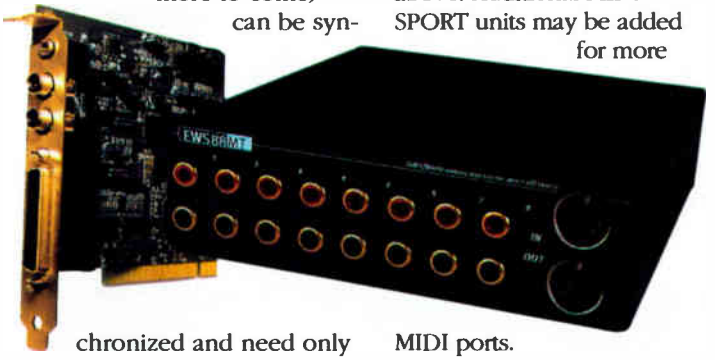
Phase response and harmonic and IM distortion are also important gauges of how the device will perform but do not directly predict how it will subjectively "sound" unless the performance borders on pathological. On the other hand, that blanket statement isn't true for jitter. Though most manufacturers fail to state anything about their products' jitter performance, again, a spec probably wouldn't say much about the sound since, like noise, there are so many aspects of jitter behavior. But, in general, jitter has a lot to do with the subjective quality of multichannel audio, because it has a lot of impact on the frequency vs. phase response, which in turn affects imaging and soundstage. Alas, many engineers are content with their pan pot-synthesized, two-dimensional world, and so is the consumer.

But, I wander from the subject at hand...and that subject is simply this: Don't believe sales and marketing hype, good or bad. Start learning about the underlying technology that you rely upon every day. And remember, the laws of physics have not been repealed just yet. For most of us, purchasing new gear means careful deliberation rather than impulse buying. You'll have to live with your purchase for quite a while. If you don't possess the expertise or aural acuity require to evaluate some box properly, then ask or buy someone who does. Your biz card sez "engineer," right? Start acting like one! ■

Oliver Masciarotte is a consultant on new media content creation issues. He's just suffered from a double shot of desert sun, with the NAB and SNIA conferences running back-to-back. While he's decompressing, your machine can contact his machine at bitstream@seneschal.net.

New Software/Hardware for Audio Production

TERRATEC EWS88 MT ▼
TerraTec's (www.terratec.net) EWS88 MT 8-channel PCI card has a new feature set. The 24/96-capable card now has an ASIO 2.0 driver, and AC-3 streams can now be sent throughout the digital output. All new EWS systems with EWS Connect (including EWS88 MT and EWS88 D, with more to come) can be synchronized and need only one driver and central panel. The included software offers a routing control panel; Windows 95, NT and MME support is also included. I/Os include S/PDIF, +4/-10 dB analog and MIDI.



Circle 340 on Product Info Card

SADIE RADIA BROADCAST DAW
SADiE's (www.sadie.com) RADiA entry-level editing system is aimed at the broadcast market and replaces the SADiE Classic. Featuring four inputs and outputs and up to 24 replay tracks at 48 kHz, RADiA will be supplied as either a single PCI card for user-configurable systems, or as a complete 19-inch turnkey hardware solution with removable SCSI audio storage.

Circle 341 on Product Info Card

MIDIMAN MIDISPORT ▶
Midiman (www.midiman.net) intros the MIDISPORT 4x4 ($199), a multiport MIDI interface for USB-equipped PCs and Macs. MIDISPORT is self-powered, Windows 98 compatible and comes with a 6-foot USB cable. It includes MIDI activity indicators for each port and OMS drivers for Mac OS 8.6 and above. Additional MIDISPORT units may be added for more MIDI ports.

Circle 342 on Product Info Card

EMAGIC LOGIC AUDIO 4.5 ▼
Emagic's (www.emagic.de) Logic Audio 4.5 has 8-channel surround capability. A surround mode can be chosen at any time, in any channel strip, and surround movements can be automated. There's also a fader to control LFE channel levels for each channel strip. The upgrade adds Audio Objects to Logic Audio Gold and Platinum: The physical inputs of an audio card can now be assigned to the new Audio Input Objects with real-time effects via inserts and bus sends. Version 4.5 also has Emagic's new Studio Description Language (SDL), for better communication between SoundDiver 3.0 and Logic Audio Silver, Gold and Platinum by describing all MIDI devices connected to the MIDI interface.

Circle 343 on Product Info Card

CREAMWARE PLUG-INS ▼
CreamWare (www.creamware.com) debuts two new plug-ins for its Scope and Pulsar systems. The STS-3000 ($198), a scaled-back version of the STS-4000 DSP sampler, features phase-locked stereo sampling, graphical editing, filters with resonance, a modulation matrix, 32 stereo voices, six audio outputs and compatibility with files such as S1000/S3000, SoundFont 2, .WAV and .AIFF. Poison (pictured, $89) is an FM synth with one carrier, two modulators and a two-pole analog filter. Rather than sine waves, Poison has a multimode oscillator and polyphonic LFO. Any source from the Project window can be used as a modulation carrier; 80 presets are included.

Circle 344 on Product Info Card

MINDPRINT DI-PORT
The DI-PORT from Mindprint (www.mindprint.com) is a rackmount stereo A/D/A converter offering 24-bit operation at either 44.1 or 48 kHz. I/Os include front panel combina-

tion mic/line ins (with automatic impedance switching), S/PDIF optical and coaxial, and an additional rear panel analog line in. The DI-PORT also features phantom power, a Front/Rear switch that allows combination of mic and line ins by routing front and rear inputs and a stated signal-to-noise ratio of 105 dB. Retail: $349.

Circle 345 on Product Info Card

TC WORKS TDM WORKS ▶ New from TC Works (www.tcworks.de), TDM Works is a TDM bundle including MasterX, Intonator TDM, VoiceStrip, Chorus/Delay, EQ-Sat and MegaReverb. Built-in tools include stereo reverb, parametric EQ, lowcut EQ,

chorus/delay, compressor, de-esser, gate, multiband expander/compressor/limiter, dithering, metering and more. Retail: $2,350.

Circle 346 on Product Info Card

UPGRADES AND UPDATES

Tascam (www.tascam.com) and **TimeLine** (www.timelinevista.com) offers the **OpenTL** (short for Open Track List) Partner Program to provide compatibility between their MX-2424 and MM Series digital disk recorder products and hard-disk audio systems from other manufacturers via a flexible EDL format. Visit www.opentl.org for more info…**HHB's CDR80 BULK Silver** is an unbranded 80-minute CD-R disc supplied in 50-disc packs, priced the same as the 74-minute CDR74 Silver BULK discs. Visit www.hhb.co.uk…**Apogee Electronics** (www.apogeedigital.com) is **re-issuing UV22, for Pro Tools.** The MasterTools UV22 Pro Tools plug-in ($200) includes UV22, DC offset removal, user-definable over indication and logging, NOVA ("no over"), phase meter and a 3-dimensional metering system…**MuziSample offers two new Pro Pack Series Soundfont CDs:** the entire library of Muzisample fonts for $62.95, or the Pro Pack Drumfont CD for $27.95. Get details at www.muzisample.com…**SADiE** (www.sadie.com) announced a development agreement to implement the **AES31 universal digital audio interchange format** in its range of SADiE workstations…News from **SEK'D: Upgrades from Red Roaster and Samplitude Studio to 2496** are now available; the Red Roaster upgrade is $299, and the Samplitude Studio upgrade is $199. Also, check out the **new features in Samplitude V5.55:** The MIDI editor now has an Undo option, a new Load CD Tracks function allows exact track marker recognition, and digital silence is correctly imported. For more features, visit www.sekd.com…**Roland's new VS-890 DigitalStudio** has 24-bit converters, plus an 8-track workstation with onboard effects and CD mastering capabilities, with optional Roland CD Recording System, and a CD-RW Mastering button and CD Writing Mode…**Seer Systems'** Web site, www.seermusic.com, offers a **free reMixer** download, SeerMusic files and JavaScript examples of how to use the software…CD duplication company Superdups introduces the InstantCDQuotes program, an online instant CD quote program that lets users log in and receive price quotes for thousands of combinations of CD packages. For more information, visit www.superdups.com…In a technology partnership aimed at developing digital rights management-enabled, scaleable audio format for streaming applications, **QDesign's** (www.qdesign.com) audio codec technology will be built into Intertrust (www.intertrust.com) and **MetaTrust-Certified** audio applications…**M Audio signed an OEM agreement with MediaTouch** (www.m-audio.com), who will be using M Audio's Delta 44 audio card in its new audio logging system…**E-mu/Ensoniq introduces the RFX upgrade card for the Ultra line of Emulator 4 Series,** which adds 32-bit effects processing, 32-bit input and output mixing, preset-based multi-effects and support for the new companion 24-bit I/O options are also being announced. Visit www.emu.com for details…**Free stuff: Tstar audio recording shareware** records unlimited CD quality tracks and offers digital editing features. **Download it from winsite.com or zdnet.com** software downloads…**New from Hammer Storage** (www.hammerstorage.com), the SLPRO12-FC/FD-FT Fibre Channel is a **RAID storage subsystem for digital media applications.** When configured with Active-Active controllers, the RAID engineers can deliver up to 190 MB/sec sustained throughput and are hot pluggable and hot swappable…**New from Sony Precision Technology, the DUC disc balance checker** measures CD-DA, CD-R, DVD and other discs. Visit www.sonypt.com for specs and prices. ■

A WORKSTATION USER GOES NATIVE...

AND LIVES TO TELL ABOUT IT

The term "Sound Card" has become a bit of a misnomer. It once referred to a generic piece of consumer-oriented hardware designed to give computers a "voice." The converters were cheesy, MIDI sounds were limited (on many models) and the DSP power was minimal. That was a long time ago—in computer years—when turnkey workstations cost tens of thousands of dollars and the heart of a professional sound card was, and still is, a hardware-dedicated Digital Signal Processor. In addition, an onboard hard disk controller made workstations like Sonic Solutions, Pro Tools and SADiE viable back in the day before microprocessors and disk drives attained today's warp speed.

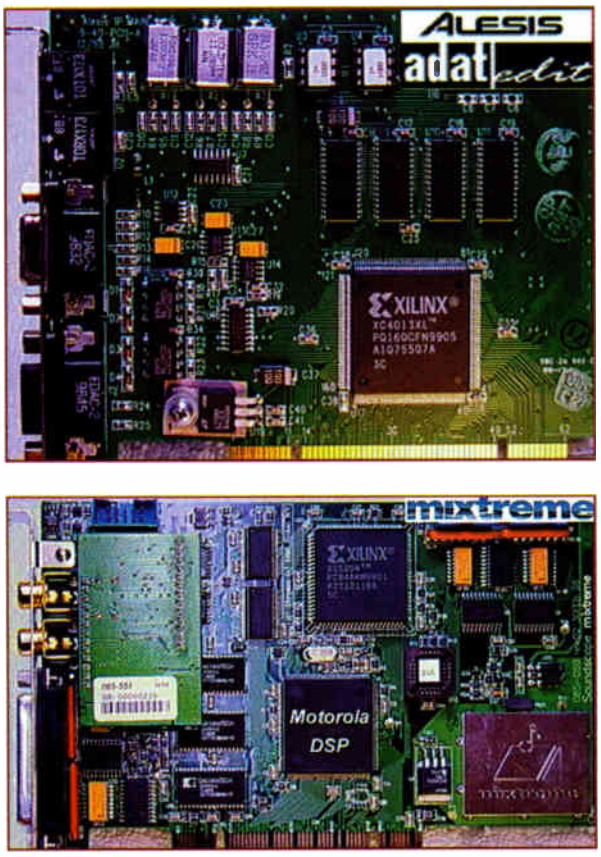


Figure 1: (top row) The Alesis ADAT Edit and Steinberg's Nuendo offer I/O, but no DSP. (Bottom Row) Soundscape's Mixtreme and Yamaha's DSP Factory combine I/O with onboard DSP processing.

À LA CARTE

That was then, "native" is now. Writing DSP-specific code is not as cost-effective as using generic code that takes advantage of the horsepower available in the latest microprocessors. Going native allows users to create an affordable workstation à la carte; users can now choose hardware specific to their needs but not limited to any one software interface.

The products covered in this article—ADAT Edit, CM Automation's Motor Mix controller, Minnetonka's MxTrax (new Native version) and Syntrillium's Cool Edit Pro—are just a few of the new breed of workstation options and accessories. These *software* products rely on minimal internal hardware, a PCI "I/O card" that is, more often than not, a simple digital interface—with no dedicated DSP. Onboard analog converters are the exception.

Minimal components on the I/O card make it more affordable to manufacture than its DSP counterpart—see Fig.1 for a hardware comparison—it's so basic that it is less likely to become extinct. The money is in the "breakout box," where you'll find analog I/O (a moving target in terms of "bits" and sample rates), digital I/O (also a variable), plus the kitchen "Sync" of timing and control—word clock, video sync, timecode, MIDI, etc.

ME, MICE ELF, EYE

Okay, fifth paragraph and you're still with me. They say you can only write

BY EDDIE CILETTI

THE DETAIL

The Great Horned Owl uses its super hearing to locate targets when it is out hunting at night. It can judge exact distance and direction of even the tiniest sound. It knows this and trusts its ears 100% when working. So should Audio Engineers. This is why Dynaudio Acoustics monitors provide the transparency and details you need to judge audio – if it's there you will know it !

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what you know, so here's my story. For several years I have been using the same workstation—the Soundscape HDR-1 PLUS—a dedicated piece of hardware that has been extremely reliable and robust, requiring minimal resources from an aged PC, a Pentium 166. I have two accelerated units capable of mixing 24 tracks to stereo and 5.1 surround.

Soundscape shielded me from the world of sound cards until last year when I reviewed Mixtreme, the company's entry into the sound-card arena. Like Yamaha's DSP Factory, Mixtreme has onboard DSP and its "mixer" is identical to that of the workstation. But in order to capture and manipulate audio via hard disk, I had to learn new editing software, and if that weren't enough, I also had to learn to configure the computer for more audio than just "You've Got Mail." It was at this time that I was introduced to Sonic Foundry's Acid and to Syntrillium's Cool Edit Pro.

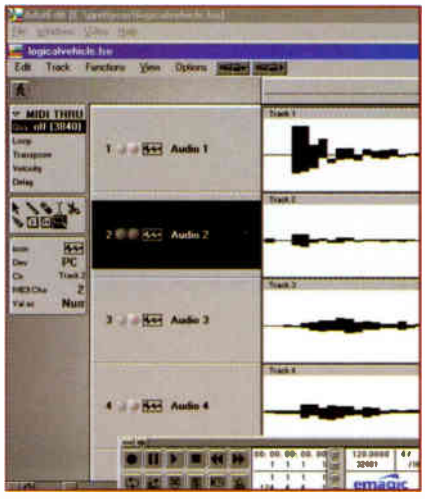
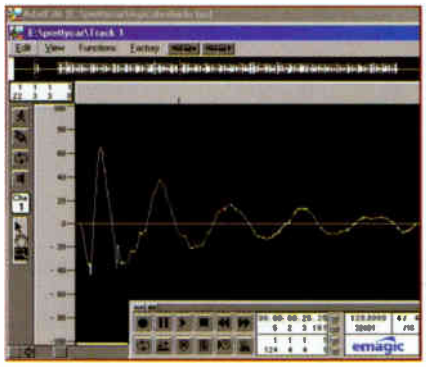


Figure 2a:
Zooming in to all tracks on ADAT Edit does not reveal enough information to view and correct phase between tracks.

Figure 2b:
The waveform edit window of ADAT Edit



AH, SOFTWARE!

Each time computers become more powerful, new software comes along to take advantage of that. We all want more tracks with lots of effects and no glitches, right? Native software is basically a recording, editing and mix "engine" that relies on your computer's horsepower to deliver the goods. The audio engine may be a stand-alone product or it may also be integrated with a MIDI sequencer. Software that makes the host processor do DSP chores is no longer "married" to a specific hardware interface, assuming there is a standard among manufacturers.

ASIO (Audio Stream Input Output) drivers interface the software with the compatible hardware, thereby opening up a whole range of à la carte options so users can mix and match according to their working style, interface needs and/or budget. ASIO drivers are more efficient than the MacOS Sound Manager or Windows Sound Drivers (Wave API and Direct Sound) and allow direct access to the card's functions, meaning reduced or no latency, lower CPU overheads, potentially more tracks, potentially more FX and access to any special DSP functions that the card may offer.

VIRTUAL INSERT: TURN ON, PLUG IN

Traditional hardware mixers offer Insert points for your outboard gear of choice. In the virtual world, "outboard" is written as a plug-in, the most well-known of which conform to Digidesign's TDM bus for Pro Tools, but there are others including Real Time Audio Suite (RTAS) and AudioSuite. RTAS and AudioSuite are also Digidesign formats; RTAS is the native plug-in format for the Digi 001. The MOTU Audio System—MAS—is another software "engine" for Macintosh. MAS is the native format used by MOTU's Digital Performer, and companies such as Kind of Loud, Waves, Antares, TC Works, BitHeadz and Propellerheads offer MAS plug-ins.

VST is an "open" plug-in architecture from Steinberg for the Windows OS and is available on the Mac version of Cubase. VST is supported by dozens of plug-ins from various companies. Other Windows plug-ins are referred to as "DirectX," but the term is different from Microsoft's DirectX set of multimedia tools (DirectDraw, DirectSound, DirectPlay, DirectInput and Direct3D). This confusion has come from Microsoft changing the names of their technologies way too often. What does matter is that audio data is processed as efficiently as possible without interruption.

JE NE SAIS QUOI

Certain types of analog gear are embraced for that sonic "*je ne sais quoi*," indiscriminately used and abused but thankfully very forgiving. In the digital realm users must stay informed—writing this article is a case in point—by knowing what is possible today and to temper expectations of things to come. (We have all suffered the promise of vaporware hyped by the next major trade show.)

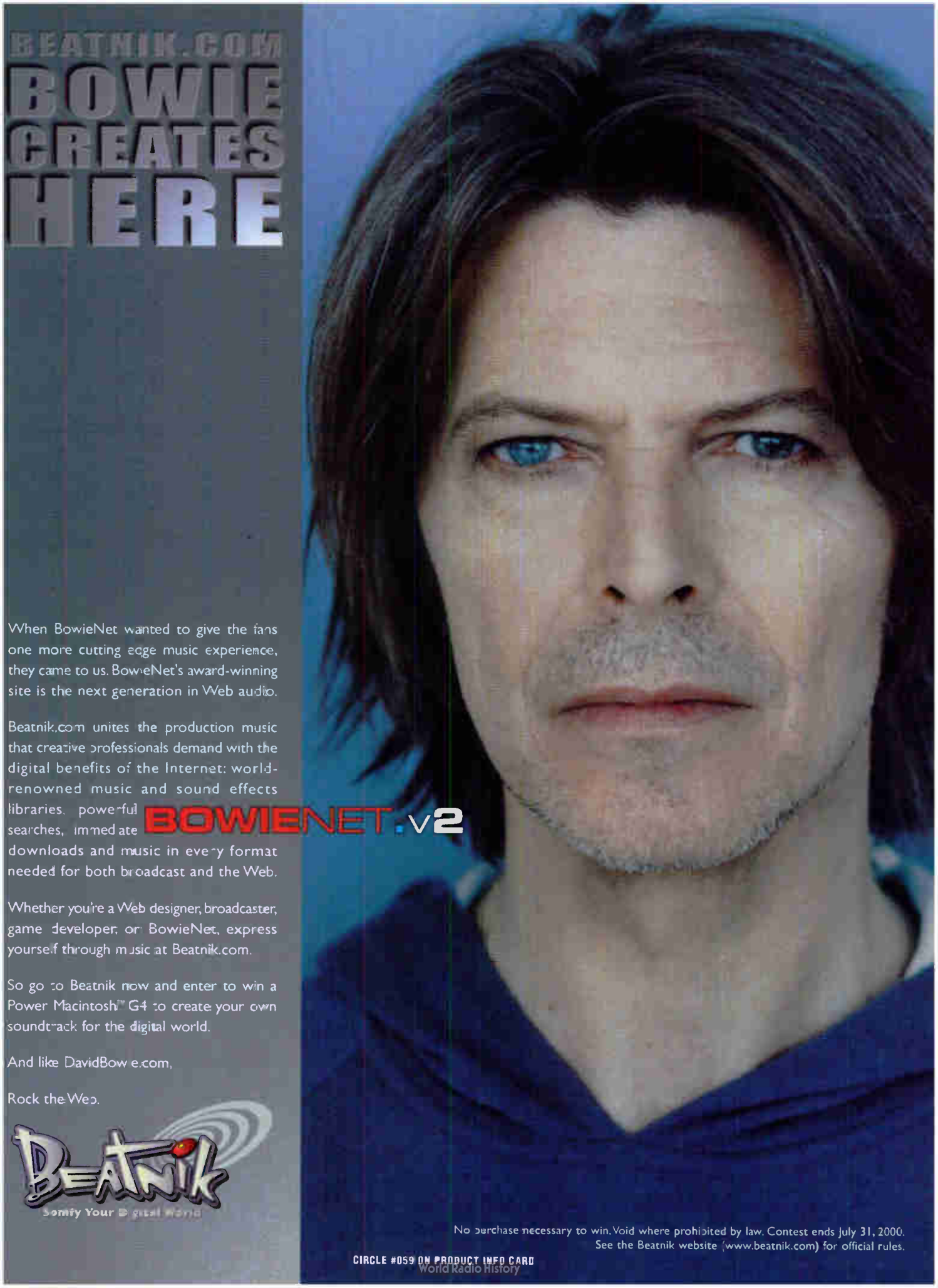
None of the Native products I tested so far are as impervious to distractions as Soundscape, which, as dedicated hardware, allows Photoshop and Word to be opened while playing a 24-track mix without even a hiccup on a Pentium 166. (I am often reviewing a product, performing screen captures and documenting via word processor all on the same box.) This is not to slam any of the Native products but to point out that nothing works as transparently as dedicated hardware.

Also, while the emphasis of this article is on multitrack, let's not forget stereo. My good friend Joe Hannigan at westonsound.com started "ages" ago with a Roland RAP-10, an entry-level card with no digital I/O. He now has several computers—all networked—recording operas to DA-38 and shooting two-camera video. For software, Joe uses SEK'D's Samplitude 2496 for mixing eight tracks to stereo with a Sonic Timeworks reverb plug-in, and he burns CDs using SEK'D's Prodif Plus card for I/O. The video is edited to the audio with Adobe Premiere. From a one-person operation with part-time help, he grew into a niche market—classical recording on a tight budget—at just the right time.

Here is a preliminary report of the products I tested (round one).

ALESIS

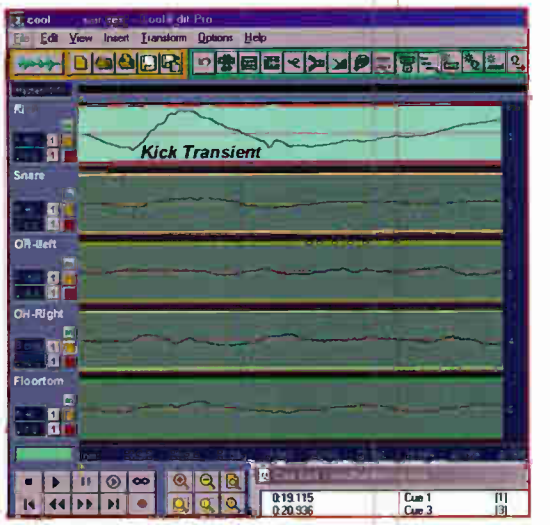
The $399 ADAT Edit system from Alesis (www.Alesis.com) includes both software and the ADAT PCR, a PCI I/O card for Mac and Windows with Lightpipe in/out plus a 9-pin ADAT sync connector. An optional breakout box has eight analog inputs and outputs using 24-bit converters. The purpose of the product is to allow users to import and export up to eight tracks with an

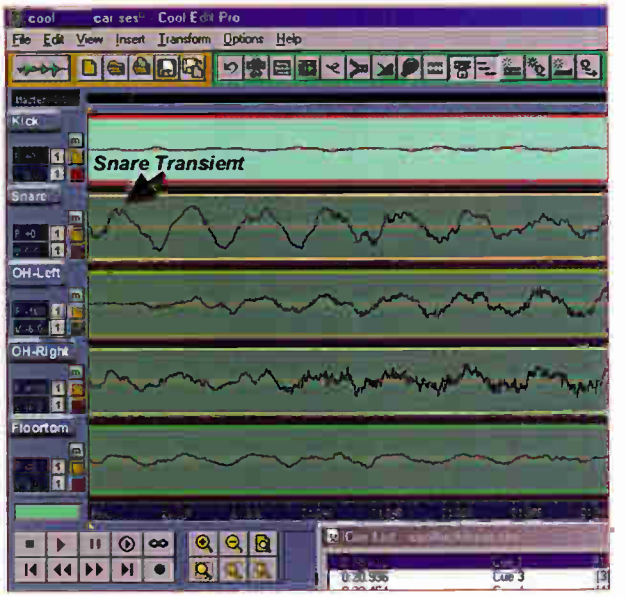


ADAT recorder while maintaining sample accuracy (no time shift).

Included with the package, ADAT Connect is the transfer software and ADAT Edit is an 8-channel editor/mixer, a MIDI sequencer *and* a notation system. (Both Connect and Edit are OEM'd by Emagic.) The package works as intended although Connect and Edit are not "integrated." For example, when using Connect, I never figured out a way to hear the transfer from tape to hard disk—although it worked perfectly—nor did I try to do the transfer from within Edit. And some users opt not to use the Edit software at all, instead pairing the card with other software such as Cakewalk Pro Audio.

The eight files were opened in ADAT Edit and all was well until I attempted to zoom in to the near-sample level. With real drum tracks recorded on an analog board with no phase-reverse switch, at minimum I knew the kick drum was out of phase with the rest of the kit. Edit can zoom in to a single audio file with great detail, but not *all* audio files. (See Figures 2a and 2b.) The beauty of importing all eight tracks at once is that all have the exact same starting point. Enter Cool Edit Pro, from Syntrillium.





Above, Figure 3a: Zooming in on all tracks using Cool Edit Pro allows precise phase alignment of drum tracks to minimize low-frequency cancellation.

Left, Figure 3b: Checking snare phase on all drum tracks using Cool Edit Pro.

SYNTRILLIUM SOFTWARE

Syntrillium Software's (syntrillium.com) $399 Cool Edit Pro is a dedicated multitrack recorder/editor/mixer that I found to be very intuitive, combining mixer and tracks in one window unlike ADAT Edit. The mixer is not nearly as cool as either ADAT Edit or Minnetonka's MxTrax, but you can fix timing errors, restore dynamics and use the built-in RealAudio plug-in to make Web-transportable mixes to send to the band. Figures 3a and 3b show the kick and snare transients after the tracks had been lined up for minimal phase cancellation. You can hear the RealAudio rough mix at www.tangible-technology.com/music/plan_B.html.

MINNETONKA AUDIO SOFTWARE

Truth be told, I moved from New York City to Minnesota because there are people out here doing cool things at companies like Minnetonka (www.minnetonkaaudio.com). What I like about Minnetonka's approach to editing is the method of trimming track entrances and exits (similar to Sound-

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scape) and manipulating and massaging crossfades (similar to Sonic Solutions).

Minnetonka's non-Native version of MxTrax ($499) supports Yamaha's DSP Factory as does the Mx51 Surround version ($895). Dolby AC-3 ($995) and DTS ($499) plug-ins are currently available. Kind of Loud will be supporting Minnetonka's Mx51 platform with its Real Verb 5.1 product.

CM AUTOMATION

A hardware fader controller, such as CM Automation's (www.cmautomation.com) Motor Mix, is useful no matter what form your workstation takes. I don't mind using a mouse, but constant mousing around is a health hazard especially for people like me who put a death grip on the poor rodent. Testing Motor Mix required the Native version of Minnetonka's MxTrax ($399), which I first saw at the Winter NAMM show in L.A. This program was still in beta as of mid-April, but it supports many control surfaces including the Mackie HUI and the Yamaha 01V and 02R.

At $995, Motor Mix packs power and full 100mm motorized faders into a compact, robust package. There are plenty of quasi-dedicated button groups including Record Enable, Mute and Solo—all illuminated—plus pan knobs and an LCD screen. All of the buttons serve double duty by way of the Shift key. Motor Mix is comfortable, not crammed, and ready to share your limited desktop real estate. Of course, you can have more than one Motor Mix and/or dedicated "transport" control with jog/shuttle wheel (also shown at the Winter NAMM). While I did little more than confirm the functionality of Motor Mix and MxTrax via automation—my wrists are thankful in advance. More to come.

DIVERGING CONVERGENCE

From a "headroom" perspective, I like the idea of a hardware-dedicated workstation. Although they may seem potentially threatened by "the Natives," the new rackmount hard disk recorders from Mackie and Tascam are perfect examples of hardware's survival. We can count on computers becoming more powerful, and I'll bet we can count on these new hard disk recorders having expanded editing features in the not-too-distant future.

Although the solution to our technical challenges is more horsepower (and more, cool plug-ins), the bigger challenge is sorting through the many options. If you're putting together a workstation, I hope this article helped. This investigation to be continued... ■

Eddie travels between Minneapolis and St. Paul using vintage vacuum-tube roller skates, which provide a warmer, smoother ride than digital roller blades. See for yourself at www.tangible-technology.com.

MY LEGACY SOAPBOX

I'm a pretty literate guy, capable of maintaining several computers on a network. The downside of the Wintel platform is that it is a "legacy" box full of potential gotchas. (Those with Apples that never glitch can cast the first stone!)

Recently, I was moving my MOTU MIDI TimePiece AV sync interface, which has served me so well for so many years, from my venerable Pentium 166 to my almost outdated 450MHz PII, connected via the parallel printer port. During installation, a pop-up warning message said the number of active MIDI ports permitted by Windows had been exceeded. Everything but the network card was pulled, the operating system was reloaded, and still the problem persisted.

Conflicts can be caused by legacy devices like Sound Blaster cards stealing resources in DOS but not reporting the same in Windows. (Network cards can be a problem also.) In my case, it was one of the serial ports—Com1 or Com2. I disabled both via CMOS setup, the driver loaded, and the software installed just fine. I cannot yet speak with authority about whether the Universal Serial Bus (USB) reduces legacy headaches, but one can only hope. ■

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PREVIEW

360 SYSTEMS TCR8 DVD-RAM ▲
360 Systems (www.360systems.com) upgrades its TCR8 Master Recorder, now with a DVD-RAM drive for backup and archiving, supplementing the 9GB internal HD (up to 50 GB optional) and Zip disk drive. Offering bit-for-bit reproduction of 24-bit PCM, Dolby-E and AC-3 recordings, the updated TCR8 boasts a 20dB improvement in S/N ratio and file interchange with DAWs using .WAV, .BWF, SD-II and .AIFF files. Additional features include multimachine sync for up to 64 tracks, hard lock to Digital Betacam for tight sync during scrub edits, comprehensive cut-and-paste editing, full timecode support and VTR emulation. I/Os include analog and digital AES/EBU ports and optional 88.2k/96kHz sampling. Price: $5,995.
Circle 327 on Product Info Card

MBHO MICROPHONES
The complete line of studio and measurement condenser microphones from MBHO GmbH (www.mbho.de) is now being distributed by MTC/MBHO, Brooklyn, NY. MBHO's top-of-the-line mic is the $1,299 MBC 408, a very large (1.5-inch) diaphragm model offering a choice of omni, cardioid or figure-8 patterns. Other features include a 6µm, gold-vaporized polyester foil diaphragm, a 5-20k Hz frequency response (in omni mode), self-noise of 13 dBA in figure-8 mode and SPL handling exceeding 130 dB. A 3-point elastic suspension shields the capsule from external vibration.
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SYMETRIX 6-CHANNEL HEADPHONE AMP ▼
Symetrix (www.symetrixaudio.com) debuts the 506E Headphone Amplifier, a single-rackspace unit that functions as a control center for headphone monitoring, accepting mono or stereo program inputs and routing them to six unbalanced stereo outputs. The unit can be used alone or with the optional Symetrix HR-1 headphone remote box. The 506E retails for $529.
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ORAM OCTARANGE ▼
Oram Professional Audio (www.oram.co.uk) offers the OCTARANGE package, a combination of rack components that combine to create an 8-channel mic mixer. Occupying only nine rackspaces, the OCTARANGE comprises the OCTASONIC 8-channel mic preamp, the 8-channel, 4-band OCTA-EQ (same as in the BEQ Series 24 Console) and the OCTAFADE, an 8x2 line-level mixer featuring 10 100mm faders, mutes and pans on each channel and a main stereo output bus with mutes and a 12-LED peak-hold meter display. Outputs are balanced XLRs. The complete package is $4,800.
Circle 330 on Product Info Card

HHB FAT MAN STEREO TUBE COMPRESSOR
HHB (www.hhb.co.uk) is now shipping the Radius 3 Fat Man stereo tube compressor, a desktop unit offering 15 compression presets (vocals, bass, acoustic guitar, mix, etc.) and a manual mode in which compression parameters (ratio, attack, release and hard/soft knee select) are user-adjustable. The VU meter can show output

PREVIEW

level or gain reduction. Rear panel I/Os are TRS, switchable between +4 and -10 levels, and a pair of front-panel instrument inputs provide for direct injection. Retail is $469; a rackmount kit for two units is optional.

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DYNAUDIO 5.1 MIX SYSTEM

Dynaudio Acoustics (www.dynaudio.com) offers the BM5.1A Complete 5.1 Mixing System, a package consisting of five matched BM6A active near-field monitors and a complementary BX30 Bass Extension System. The BM6A has a 7-inch woofer and a 1-inch soft-dome tweeter, each powered by MOSFET power amps rated at 100W. An electronic 4th-order phase-aligned crossover divides the input signal at 2.2 kHz. The BX30 sub uses a 12-inch woofer in a ported cabinet with a 130W amplifier. Three precision lowpass networks are calibrated for Dolby, DTS and THX standards. System price is $9,497.

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DPA LARGE DIAPHRAGM MICROPHONE KIT ▲

DPA Microphones (www.dpamicrophones.com) offers the 3541 Large Diaphragm Microphone Kit, a complete package including the modular 3541 microphone, consisting of the MMC4041 capsule and interchangeable MMP4000 tube and solid-state mic preamps, suspension mount, windscreen/pop filter and mic cable, all in a Samsonite carrying case. Offering a low noise figure of 7 dBA max, the MMC4041 capsule features a stainless steel diaphragm and is capable of accepting input levels of 144 dB SPL before clipping. Frequency response is 10-20k Hz with a 4-6dB boost around 8 kHz; dynamic range is 113 dB.

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SOUNDELUX R-1 CONDENSER MIC

The R-1 from Soundelux (www.soundelux.com) is a studio-quality cardioid condenser microphone with an all-discrete component FET design and a double-mesh windscreen. Featuring a 1-inch diaphragm with gold on 6-micron-thick Mylar, the compact R-1 is housed in an all-metal body with a satin nickel finish. Frequency range is 20-18k Hz, EIN is 9 dBA and maximum SPL is 138 dB (0.5% THD @ 1 kHz). The R-1 is $599; a $59 "donut" shock-mount is optional.

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DEMETER SPRING REVERB

The Realverb from Demeter Amplification (www.demeteramps.com) is a 2-channel rackmount spring reverb device containing both a short (1.5 second) and long (3.5 second) Accutronics 6-spring reverb tank. The unit offers separate Input, Output and Mix level control pots for each channel, and both channels also feature front-panel phase reverse, high-pass filter switches and an overload indicator. Inputs and outputs may be separately linked for stereo/mono and mono/stereo configurations. Frequency response is 20-20k Hz. I/Os are fully balanced XLR or TRS connectors. Price: $699.

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SCHOEPS STEREO MIC PROCESSOR ▲

The DSP-4P Microphone Processor from Schoeps (www.schoeps.de) allows an engineer to modify the polar pattern of a given microphone, either to improve its directional characteristics or to emulate another microphone. The DSP-4P provides front-panel controls to modify the polar pattern in three selectable frequency ranges, and modifications may be made to recorded tracks, as well as to live microphones. Two microphones can be processed simultaneously for stereo, and both X/Y and M-S patterns are accommodated. User presets may be stored and recalled via front-panel push buttons. I/Os are both analog and AES/EBU digital.

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MARSHALL TUBE CONDENSER MIC

Marshall (www.marscam.com) offers the MXL V77 tube condenser microphone, a cardioid pattern studio model with a 3-micron-thick diaphragm in a 25mm diameter capsule, transformerless output and a 6072 tube. Frequency response is 20-20k Hz, EIN is 17 dBA, and max SPL is 122 dB (1% THD). The V77 is supplied with a durable plastic case, shock-mount, foam windscreen, power supply and 15-foot multipin cable. Price: $699.95.

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PREVIEW

ADK TUBE MICS

ADK Microphones (www.adk.com) is shipping two new large diaphragm tube microphones, both with Class-A electronics. The $795 model A-51TC has a single cardioid pattern with 1-inch diaphragm capsule. The $995 model Area 51 Tube Transducer boasts dual 1-inch diaphragms and nine remotely variable polar patterns (omni, cardioid, figure-8 and six intermediate steps). Both include a deluxe flight case, shockmount, foam windscreen and power supply.

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AMEK PURE PATH SIGNAL PROCESSORS ▲

Amek (www.amek.com) has introduced its Pure Path line of rackmount signal processors, leading the new range with the Channel-in-a-Box, or CIB. Essentially a repackaging of the Amek 9098i console strip, the CIB has mic/line preamps, 4-band EQ, high- and lowpass filters and compressor, all in one rackspace. Designed by Rupert Neve, the Pure Path line also includes the Driver-in-a-Box (DIB), eight separate transformer-coupled line amplifiers with individual trims controls, and the Stem Compressor, a multichannel compressor/limiter with eight digitally-controlled analog processors. Prices are $3,250 for the CIB and DIB and $6,995 for the Stem Compressor.

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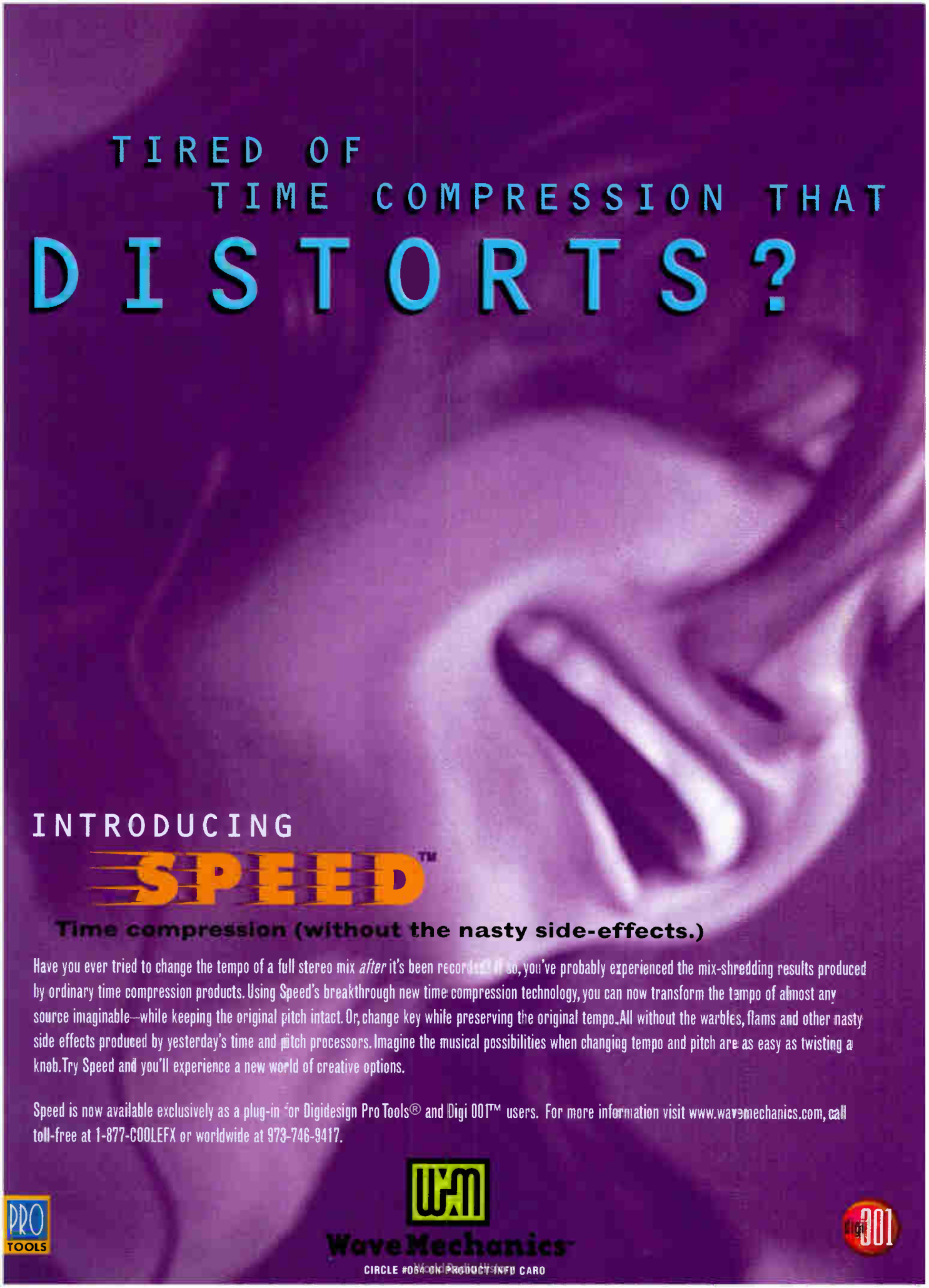
HOT OFF THE SHELF

Emmy-nominated 615 Music adds 10 production music releases to its Platinum series. The new series includes such titles as Electronicity, Firestorm and Jump, Jivin', Swingin'. Each disc has 12 to 17 themes, edited to varying lengths. For more information or to hear samples, call 615/244-6515 or visit www.615music.com…**Klark Teknik updates its DN1414 multiple DI module and DN1248 active splitter system** with a 140x70mm rear-panel cutout, allowing users to retrofit a multipin connector. Call 616/695-4750 or click on www.klarkteknik.com…*Project Studios: A More Professional Approach*, a 274-page paperback book ($47.95) by **Philip Newell**, is based on 30 years of experience in the recording industry, and addresses a wide range of topics, including loudspeakers and acoustics, problem-solving and getting pro results. Call 781/904-2620 or visit www.bh.com/focalpress…**QSC introduces a new compact DSP module** for its DataPort-equipped amps. Configured via drag-and-drop software and an RS-232 serial port, the DSP module controls input attenuation, input sensitivity, mute and polarity reverse. A 2:1 mixer and a signal splitter are available and various crossovers, filters, delays, comp/limiters and parametric EQs may be selected. In other news, QSC's Ethernet-based computer-controlled amplifier management system, QSControl, now supports drag-and-drop programming, MIDI and extended monitoring capabilities. Call 800/854-4079 or click on www.qscaudio.com…**Westlake Audio's new full-line product catalog** describes all of its professional monitoring products. For your copy, call 805/499-3686 or visit www.westlakeaudio.com…**Spirit by Soundcraft offers the Digital 328 CD-ROM**, an interactive guide to the Digital 328 digital console. For a free CD-ROM, call 800/255-4363 or order it online at www.spiritbysoundcraft.com…**TC Electronic has upgraded the Finalizer to 96kHz sampling rate**. The unit now performs full up/down sample rate conversion at 32, 44.1, 48, 88.2 and 96k, with asynchronous conversion. Current Finalizer 96k owners can upgrade at a nominal cost. Call 805/373-1828 or visit www.tcelectronic.com…**Otari's Version 2.09 software for its RADAR II disk recording system** includes new feature enhancements plus support for backup options such as DVD-RAM and SCSI hard drives. Accessing the new Waveform Display features requires a hardware upgrade; Otari offers a complete kit with instructions and release notes. Call 818/598-1200 or surf to www.otari.com…**The 108-page TAI Audio catalog** lists the many microphones, mixers, speakers, amps and accessories that the company stocks for sale or rental, with an emphasis on film/video production sound. For a catalog, call 800/486-6444 or visit www.taiaudio.com…**Wenger Corp's new acoustical door is specifically designed for built-in construction.** For more details on Wenger products, including the V-Room sound-isolating, modular broadcast booth, call 800/733-0393…**Gepco International's 5596 series of 110-ohm AES/EBU digital audio cable** is designed for transmission of all formats of AES3 digital audio, including 24-bit/96 kHz. Call 800/966-0069 or click on www.gepco.com…Big "D" Broadcast Exchange offers **re-creations of vintage RCA 77-DX microphones**, priced at $995, or in the umber gray "TV" model for $795. Designed for prop use, the mics have no capsules, although a compact mic can be placed inside for stage or broadcast work. Parts are precision-made and are also available as individual spares for restoring vintage mics. Visit www.bigdmc.com or call 765/935-2443. ■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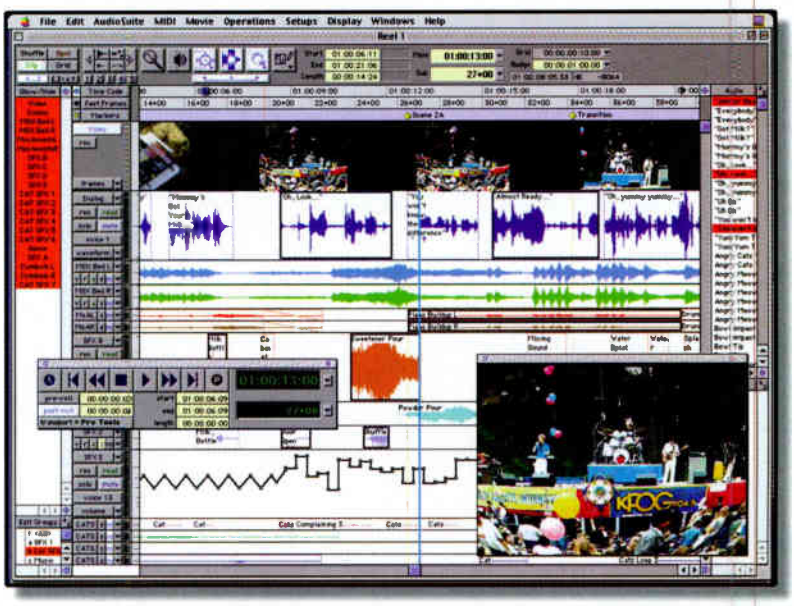
FIELD TEST

DIGIDESIGN PRO TOOLS 5.0

DIGITAL AUDIO WORKSTATION SOFTWARE

In another step toward taking the Pro Tools platform to the next level, Digidesign offers a major revision of its Pro Tools digital audio workstation software. The upgrades in this new version are few in number, but they are major in scope, with several new editing tools, a refined user interface, optional video media support, MIDI sequencing and some system extension refinements that improve overall performance. For this review, I focused on music editing and MIDI features.



New in Pro Tools 5: MIDI sequencing, Avid video import/capture/playback options, an updated interface and new editing features.

AT THE STARTING BLOCK

Pro Tools 5.0 comes on a new installation CD-ROM—no online upgrade is available. Users who bought Pro Tools|24 MIX or MIXPlus systems after April 19, 1999, are eligible for a free upgrade. Otherwise, it costs $199. As a bonus, buyers of a new MIX system receive a free TDM MIXpack consisting of Digidesign's D-Verb, Focusrite's d2 and Dynamics by Drawmer. Purchasers of MIXPlus systems also receive Focusrite's d3, Line 6 Amp Farm and Access Virus. (The first TDM-based virtual synthesizer, Virus is awesome!)

Installation is routine. Double-click the installer application on the CD-ROM, and a Pro Tools 5.0 folder is created on your hard drive. (I installed the program on a Mac G3 266MHz desktop model outfitted with a 24 MIXPlus system.) Drivers and extensions are updated automatically, no hassles. However, the preference settings from my old version were not copied over. Unaware of this, I began using 5.0 and wondered why things weren't responding normally (e.g., insertion points acted oddly, synchronization was off, missing I/O labels, etc.). Fortunately, I still had Version 4.2 installed; that was handy as a reference to remember my preferences, which I manually re-entered into the new software—a bit of a pain.

Digidesign's ProControl worked fine with the new version and was a breeze to set up—simply enable ProControl in the Peripherals window and you're ready to roll. Getting Mackie's HUI to function properly was a little trickier. I set up HUI as a MIDI controller in the peripherals, as usual, but Pro Tools wouldn't respond, reporting that it was "unable to communicate with HUI." Turns out, with the new MIDI features, HUI must also be selected as an input device under the Input Device menu (which you'll find in the main MIDI menu, a new item on the menu bar). Once I had done this, HUI performed flawlessly. This scenario will be the same for any MIDI controller.

A new version of TrackTransfer, Version 2.1, is installed with Pro Tools 5.0. I depend heavily on TrackTransfer to swap tracks between sessions. Unfortunately, Version 2.1 doesn't recognize sessions created with Pro Tools versions earlier than 5.0. In order to use TrackTransfer on older sessions, they must first be converted to 5.0. To do this, open the old session in 5.0 and execute a Save As—conversion is automatic.

BY ERIK HAWKINS

BETTER BY FAR

There are several significant, though inconspicuous, interface improvements that make the program a lot easier to operate. To begin, the Smart Tool button has disappeared, replaced by a small, space-efficient, bar beneath the Trimmer, Selector and Grabber tool buttons. Hitting this bar highlights all three icons and turns the cursor into the Smart Tool—pretty smart.

The Trimmer, Grabber and Pencil tool buttons now sport submenus. Clicking and holding the button opens up the tool's options. Grabber modes include Time (the standard mode), Separation (the selection is cut at the same time it's moved), or Object

"I want it that way."

Tim Lamoy (left), House Engineer for the Backstreet Boys, and Monitor Engineer, Chris Holland

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(moves only the object selected, regardless of whether or not the track is part of a group). The Pencil has five different drawing modes, from Freehand (the old standard), to Line (straight lines only), and Random (for way-out designs). In addition to the regular Trimmer mode, there's Scrub (which trims and scrubs simultaneously) and TCE (the appropriate amount of time compression or expansion is applied to the selection to make it fit to the trim location—way cool). The new Trimmer and Grabber modes function in tandem with the Smart Tool, making the Smart Tool extremely flexible.

Multiple timeline rulers can now be displayed simultaneously (e.g., hours:minutes and bars:beats), in the Edit window. Location markers are visible on their own dedicated ruler, complete with names. The bright yellow markers are easy to see and can be freely dragged about. (Indeed, they're so easy to move, a way to lock their positions down would be nice.) A large Main counter and smaller Sub counter are seen in both the Edit and Transport windows. Each counter can show all available time formats, independent of the other. Discrete Grid and Nudge displays let these two functions operate separately. For example, Grid could be set to whole notes and Nudge to a single millisecond. This is excellent for dialing in "a feel" during music production.

Digidesign 1622 I/O support has been added to the Playback Engine Setup. Once selected as an interface, the 1622's gain is controllable directly via a 0dBV to +18dBu A/D input reference level mixer under Other Options. The 1622's ¼-inch I/Os are particularly nice for keeping synthesizers and other line-level instruments normaled to Pro Tools, negating the need to run everything through a mixing board—perfect for project and pro studios alike—I love it.

Import, capture and playback of Avid video media is now available (for Mac), in the form of a hardware upgrade, AVoption, which retails for $7,995. DigiTranslator, Digidesign's OMF (Open Media Framework) application, which converts Pro Tools session files to OMF files (or vice versa), for compatibility with other media workstations, is free with the purchase of AVoption. (The software by itself is $495.) And speaking of different media formats, an MPEG3 export option, MP3 Export, is available as a download online for an affordable $19.95.

Greatly improved DSP handling is high on my list of favorite improvements. With the aid of several System Extension updates—in particular, DSP Manager 1.1—DSP allocation is, generally, faster and smoother. With older Pro Tools versions, trying to reload a session jam-packed with plug-ins was, often, asking for trouble; there were moments with Version 4.2 when the software refused to open a session until I played plug-in shuffleboard with the DAE Plug-Ins' folder in order to fool the DSP Manager—an awful waste of time. No such problems with 5.0: It opened every session I threw at it, even old 4.2 sessions with tons of plug-ins. In fact, the old 4.2 sessions that showed no DSP available registered as having DSP to spare in Version 5.0.

MIDI MACHINATIONS

The new MIDI features are very intuitive. If you're familiar with the way most software sequencers operate, you'll feel right at home with Pro Tools' MIDI tracks. However, as Digi's first foray into the world of MIDI sequencing, Pro Tools is missing some of the goodies (e.g., groove controls, remote control SysEx templates and Control Change message transform functions) hard-core users have come to expect from the more established platforms. The good news is, all the essential tools are there to cut solid MIDI tracks at over 960 ppqn (according to Digidesign, the actual sequencer engine is 960,000 ppqn) for sample-accurate audio-to-MIDI timing, but 960 ppqn is the user interface resolution. Pro Tools can even import/export standard MIDI files, for doing advanced sequencing in another application and then simply importing tracks into Pro Tools. I tried this and it worked great.

Editing functions are nicely implemented. Quantize can be applied to a selection or at input in a variety of note values, from whole notes to 64th notes, dotted and triplet values. Swing, offset, strength and randomize parameters are available. Note ranges are easily selected, split and transposed. Velocity and duration can be manipulated, scaled and faded with custom curves.

The recording modes are replace and merge; either mode will operate in loop. Recording will follow countoff or wait for first note, your choice. The countoff is user-definable, and the click can be assigned to any MIDI instrument in your OMS Studio Setup—I prefer an internally generated click, as it's easier to deal with. An input filter lets you select what kind of MIDI information is ignored. (The stock setting has polyphonic and mono aftertouch checked.)

Meters and tempos are adjusted using the Tempo and Meter Change windows—pretty straightforward. Also, the old Identify Beat feature is still available under the Edit menu. As another alternative, turn the Conductor icon "off" in the Transport bar to enter the Manual Tempo mode. In this mode, you can type in a BPM, use the slider element or hit the Tap button to change a session's global tempo. Both tempo and meter now have discrete rulers that are seen simultaneously with the timeline rulers.

MIDI tracks in both the Edit and Mix windows look almost identical to audio tracks: The user interfaces are the same; the only difference is the way the information is displayed. In the Edit window, notes are seen in place of waveforms and controller information in place of automation moves. MIDI tracks appear as input channel strips in the Mix window. The

MIDI MENU ITEMS

A palette of MIDI parameters is one of the new additions to Pro Tools 5.0. The following MIDI menu items are well implemented, providing a variety of editing and recording options.

- Change Tempo
- Change Meter
- Quantize
- Change Velocity
- Change Duration
- Transpose
- Select Notes
- Split Notes
- Input Quantize
- Click
- Click Options
- MIDI Beat Clock
- Input Filter
- Input Devices
- MIDI Thru
- All Notes Off

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LED meter is turned into a dynamic MIDI activity light. Of course, the MIDI channel strips don't have plug-in slots—although MIDI plug-ins (e.g., arpeggiators, delays, controller templates, etc.) aren't such a bad idea. The New Track command used to make audio tracks is also used for creating MIDI tracks.

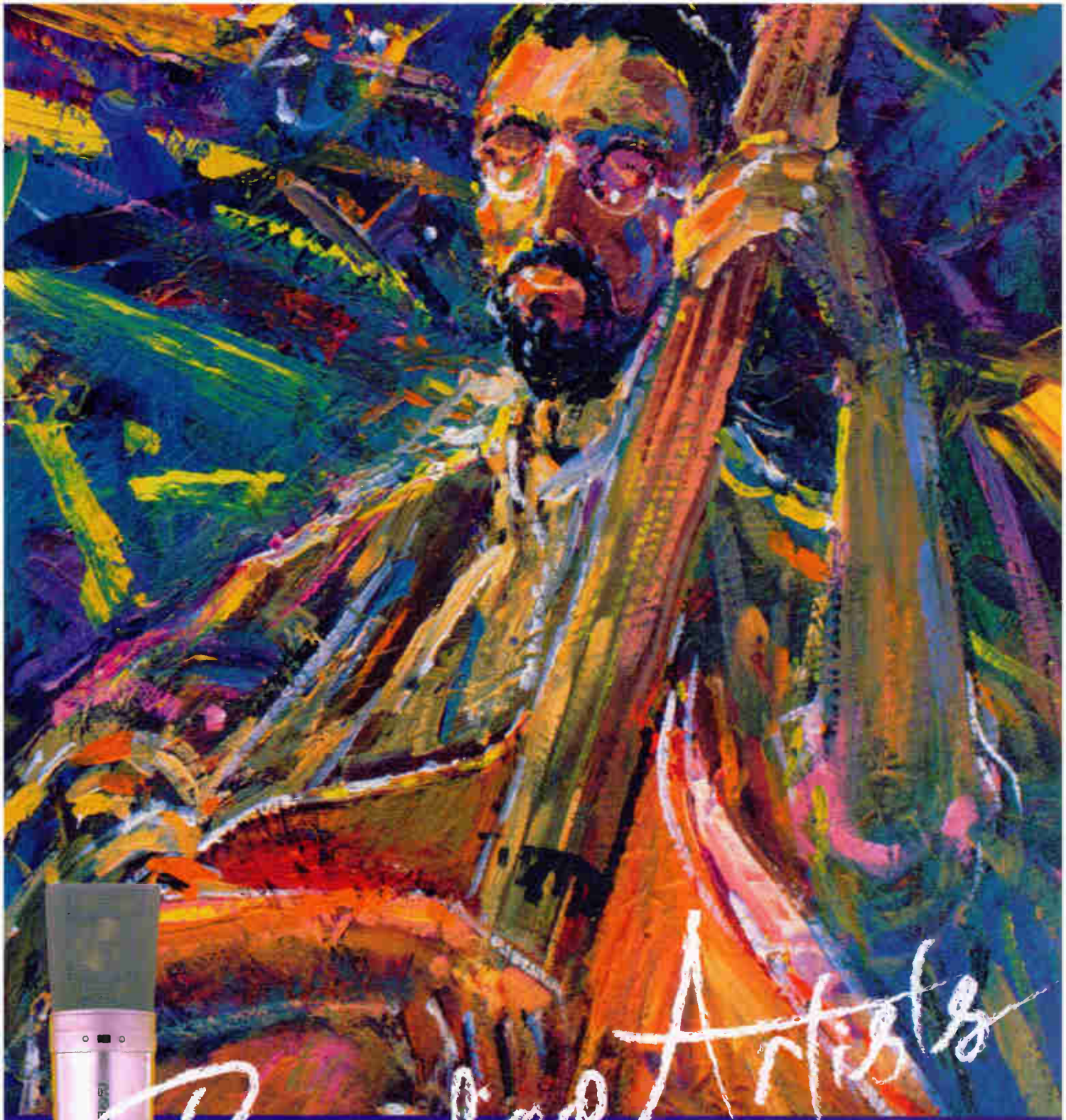
Overall, MIDI timing was rock-solid. However, I did encounter some MIDI log jams while using Pro Tools with HUI. When several MIDI tracks were playing, and I was, for example, tweaking a plug-in via HUI, MIDI playback would hiccup. The hiccup would only last a split second and then everything would lock back up, but it was long enough to disturb the groove (especially when trying to cut a take to the virtual tracks). I'm not sure what the ideal solution is for this situation, disable HUI or turn the virtual tracks into audio tracks, but either way, it isn't impossible to work around. (Digidesign says there were some software driver problems with MOTU's MTP AV, the interface I was using, which might have caused the hiccups.) If you can afford ProControl, maybe this is the way to go, because it isn't MIDI-based and won't clog the MIDI lines. (Perhaps Digidesign could make a less expensive ProControl for financially challenged folks like myself.)

UP, UP AND AWAY

This latest version of Pro Tools is super; better DSP management, more editing tools, a refined user interface, added media and hardware compatibility and MIDI sequencing as a bonus. Whether you're into music production or post, there's something in Version 5.0 sure to tickle your fancy. And if this isn't enough, DirectConnect (available for free download at Digidesign's Web site) opens up a whole new world of native instruments (e.g., Koblo's Studio9000) for plugging right into your Pro Tools mixer.

Digidesign, 3401-A Hillview Avenue, Palo Alto, CA 94304; 650/842-7900; fax 650/842-7999. Web site: www.digidesign.com. ■

Erik Hawkins is a musician/producer working in Los Angeles County and the San Francisco Bay Area. Visit him at www.erikhawkins.com for more equipment chitchat and tips on what's hot for the project studio.



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TERRASONDE AUDIO TOOLBOX VERSION 2

PORTABLE AUDIO TEST SET

Now in its second generation, TerraSonde's Audio Toolbox Version 2 is a collection of DSP-based maintenance tools that any studio will find useful. The original Audio Toolbox Version 2 is compact and lightweight and covers a wide range of useful functions. Other versions include a rackmount model and a handheld "Plus" version.

The Toolbox performs so many functions that it would be difficult to detail them all, so I will describe the primary functions and discuss the unit's overall performance. As acoustics is my specialty, I have concentrated on those functions.

THE HARDWARE

The standard box measures 5.5x9.5x2.5 inches, weighs only 2 pounds and is made of molded plastic with a 2.4x1.75-inch backlit LCD screen. A single knob switches between programs and is used to make parameter adjustments and data entries. A calibrated microphone is built into the unit, but you can also connect any measurement mic. The box seems rugged, although I typically wrap the unit in bubble-wrap when shipping. It can be powered by a removable battery pack (six AAs) or a wall wart power supply.

Inputs and outputs are mounted on the sides of the box. Balanced XLR, ¼-inch and RCA left and right inputs are available. There is one MIDI input and two MIDI outputs, along with a single headphone jack, a small built-in speaker and single RCA, ¼-inch and XLR outputs.

THE SOFTWARE

The main menu offers four functions: Acoustic Analysis, Test Functions, Session Helpers and Utilities. Six submenus under the Acoustic Analysis menu include Sound Level Meter, Real-Time Analyzer, Energy Time Graph, Reverb Decay Time, Polarity Tester and Noise Criteria.

The Sound Level Meter function measures loudness in standard dB SPL units. It is a true RMS measurement, using ANSI Type 1 standard display time averages with A, B, C and flat weighting networks. Averaging modes include Slow, Fast, Impulse, Peak and LEQ. LEQ is used for computing equal-weighted SPL averages over a long period (for you OSHA types). The internal or external mic can be selected, with two sensitivity ranges available. Measurement data is presented as both a numeric readout and a bar graph. Full control of the signal generator is available directly from the Sound Level Meter screen. Selectable waveform types include sine and square (frequencies are adjustable) and white or pink noise.

The Real-Time Analyzer looks at the sound spectrum in 1-, ⅓-, ⅛- and 1/12-octave bands, with good resolution although the screen is tiny. Data can be viewed in a full-bandwidth window of 20 to 20k Hz as well as a low-frequency 10-to-332Hz window, a useful view that covers the area of most critical analysis. A variety of averaging times is provided for exponential or equal-weighted time averaging. The display is adjustable in 5dB increments with a 35dB window range from top to bottom, offering a wide picture of spectral activity. The low end of the scale is 25 dB with the maximum being 170 dB.

BY BOB HODAS

One cool "extra" field gives a variety of useful additional information, such as the band that has the highest momentary level (Hz max), the full-band SPL level (dB SPL), the A-weighted SPL (dBA SPL), or the C-weighted SPL (dBC SPL). To assist in setting surround 5.1 monitoring systems, two more fields measure dBL SPL and dBm SPL. dBL shows the average SPL level of the subwoofer bands (as defined by Dolby Labs), 25 to 125 Hz, while dBm SPL shows the average SPL of the non-subwoofer bands. I tend to rely more on the spectrum display for subwoofer calibration, but this feature offers a handy correlation. Forty nonvolatile memory locations for storage can be recalled in the Toolbox or transmitted to a PC or Mac for printing. Data parameters for the recalled memories can be adjusted for critical analysis.

The Energy Time graph displays the initial delay time from the sound source and the subsequent decay pattern in the room. This is useful for finding room reflections, identifying resonances and aligning delay systems. The data can be viewed as time or distance, with the measurement units displayed in milliseconds, feet, inches, meters or centimeters. (I did not find a frequency display effective.) The capture window is adjustable for the measurement

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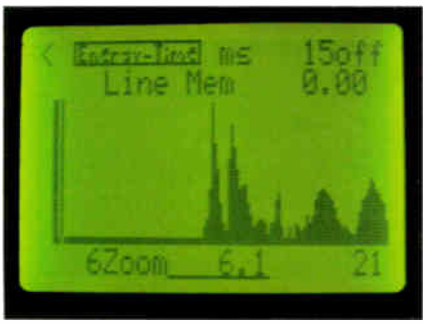
units. For example, in milliseconds, the window ranges from 15 to 960. This is handy for controlling the amount of detail you need. Moving the cursor across the screen displays the time (or distance) for that point numerically, along with the dB level relative to the maximum value received. This lets you find room reflections in units of distance. While the program is running, you can zoom in on areas of the chart for more detailed analysis (15ms window). You can store 40 graphs in nonvolatile memory with the same functionality as the RTA.

The Reverb Decay Time function computes the reverb decay time for a room, referenced to RT60. The full-band (20 to 20k Hz) flat measurement is actually extrapolated to find the RT60 value, since a full 60 dB of S/N ratio is often not available (a minimum of 30dB S/N is recommended). The Decay Time field displays the actual time (in milliseconds) for the sound field to decay by the displayed Decay Range amount.

The Polarity Tester function is worth its weight in gold—a decent tester costs $250 to $300 alone—and I can't tell you how many times I've found studio speaker components out of phase! Toolbox lets you test mics, patchbays and anything else in the studio with an innie and outie. Since it's tethered to a cable, the one-piece unit can be a bit restrictive when "popping" speakers, but this is a minor inconvenience. If you have older gear, remember that Toolbox is a pin-2 positive unit. Three separate setups are programmed into the polarity tester for testing speakers, microphones and line-level equipment. A signal strength meter lets you adjust volume levels to get a good reading (most other testers can give false readings at improper levels).

The Noise Criteria function is used to determine the background noise level in a room, according to ANSI specification S12.2-1995. In operation, the room noise is divided into octave-band divisions, and the acoustic level of each band is computed in dB SPL. Then, the results are compared to standard noise criteria curves and a single value is determined from the highest curve number that any octave band exceeds. Also, the Speech Interference Level (SIL) can be computed. This value is the average dB SPL level of four octave bands centered on 500 Hz, 1 kHz, 2 kHz and 4 kHz. SIL is also defined in the ANSI standard that specifies Noise Criteria. These functions don't mean much to the average studio owner but are necessary for comprehensive field measurements.



Energy Time Graph screen

Real-Time Analyzer screen at ½ octave resolution

Sound Pressure Level Meter screen

TEST FUNCTIONS

The Test Functions submenu offers Signal Generator, Level Meter/Frequency Counter, Signal-to-Noise Ratio, Sweeps, Sample Scope and a Distortion Meter.

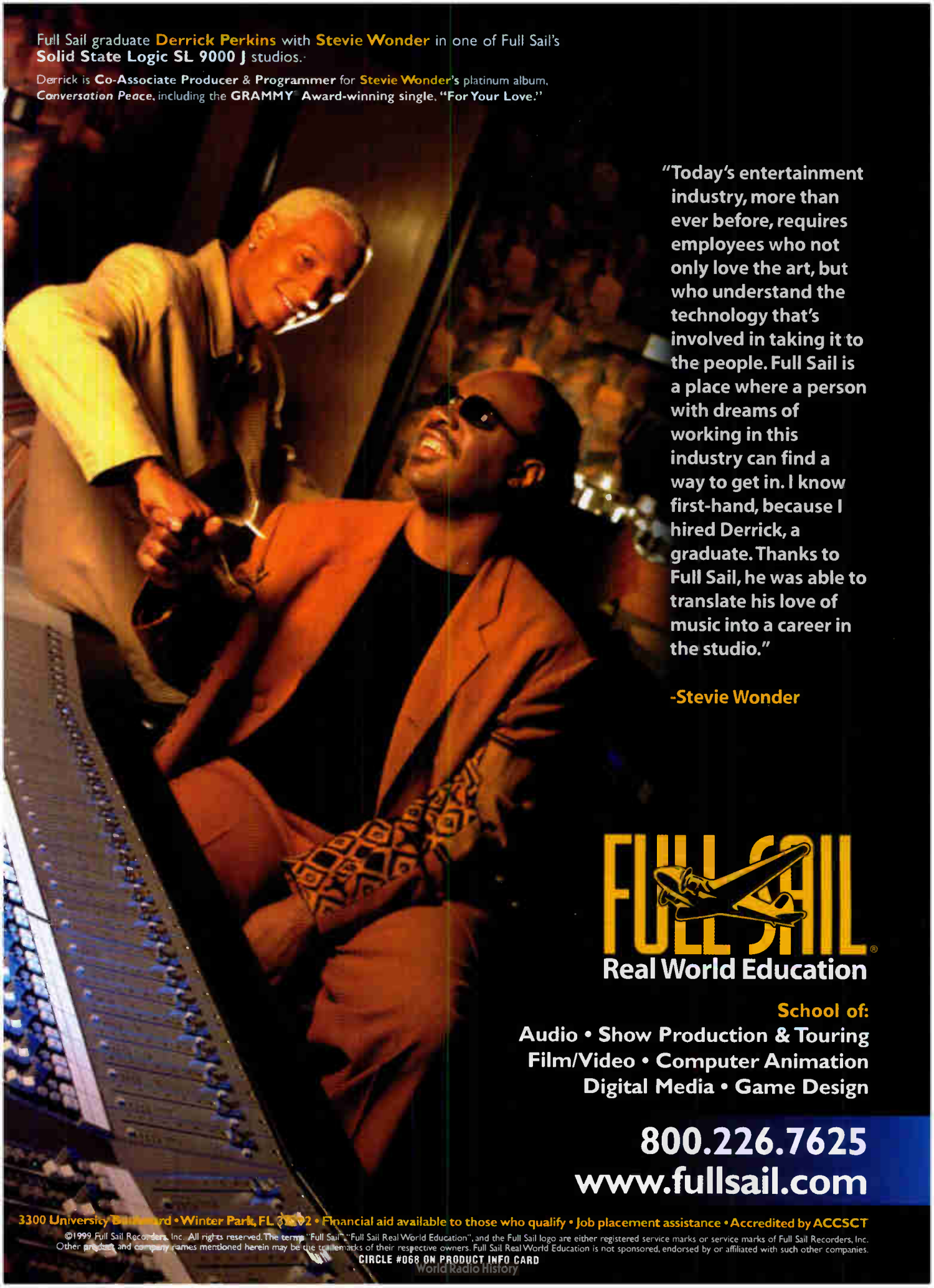
The Signal Generator offers a control surface for acoustic measurement programs and creates waveforms used in testing, audio analysis or recording. Output levels for sine and square waves, white noise and pink noise can be adjusted in fine and coarse modes, while the unit displays the actual output level present, including loading from the device connected to the outputs. A Polarity Waveform feature lets users test polarity within a circuit; an Impedance Meter function is also provided.

The auto-ranging Level Meter accurately measures the level for both inputs simultaneously. Four submenus are available: a stereo audio level meter, a stereo frequency counter, a stereo dB meter and a stereo VU meter. The signal level units may be selected from among dBu, dBV, Vave, Vrms, and Vp-p and are displayed numerically. Readouts are displayed numerically, as well as with bar graphs for the VU and dB meters, and include peak indicators. In the Frequency Counter, both inputs are read and displayed independently. The frequency counter requires a fairly clean repeated waveform (such as a sine wave), and if the frequency cannot be determined, the figure "—" is shown. The range is 16 to 50k Hz; +4dBu and -10dB modes are available. The meters have very good resolution for fine adjustments.

The Signal-to-Noise function allows you to test the S/N ratio for any line-level device. This is a simple subtractive measurement and operates at +4 dBu or -10 dBV.

There are three Sweep functions: Frequency Response (amplitude) sweep, Impedance sweep (impedance of a load vs. frequency) and a programmable sine wave sweep. The Frequency Response function computes the gain of a device as a function of frequency. The Impedance sweep computes the impedance of a load as the signal generator is swept continuously from 20 to 20k Hz. The x-axis scale is variable from 20 to 20k ohms. Both the Frequency Response and Impedance sweep functions can operate in ⅓- or ½-octave mode, and the function averages the results over the selected ⅓- or ½-octave band. Results are displayed graphically on the LCD. Start and end frequency points (⅓-octave), as well as duration, may be set for the programmable sweep. There are 40 nonvolatile memories available in this mode.

The Sample Scope is essentially an audio bandwidth digital oscilloscope. While a typical digital oscilloscope has a bandwidth of several megahertz, the Sample Scope only has a 48kHz bandwidth, so this is a very low-resolution display in comparison. Also, DC is blocked, so only the AC component of



a waveform is viewable. High-frequency waveforms (above 10 kHz) may not be represented properly. The scope was just barely useful for setting azimuth on a tape machine. The scope can also be used for identifying repetitive waveforms and obvious clipping, distortion and over-ranges, or a graphical phase meter when used in X-Y mode. It is slow, so while it does tell you what is going on, I would much rather use a dedicated scope. You can vary the screen-time width from 2 to 80 ms, and you can turn on the 30dB input pad or 40dB input gain amplifier. The vertical scale can be adjusted from 1 to 64 times. The Sample Scope auto-triggers, so repeated waveforms may be seen. The maximum on the vertical scale is 0 dBfs (full-scale digital), so you can see if an input signal is clipping the digital input.

The Distortion Meter uses FFT analysis to compare the level of the fundamental frequency with its harmonics. This function generates a sine wave at either 63, 125, 250, 500, 1,000 or 2,000 Hz, and sums the energy in the upper harmonics (and residual noise) to compute the THD+N. The range is 0.2 to 50%. The optimum frequency for lowest residual distortion is 125 Hz. At this frequency, you can read down to nearly 0.15%. The input signal level (line or mic level, selectable) must be constrained within a window, so a small bar-graph level meter is provided. The display shows the value numerically, and also has a bar graph using a log-scale from 20 to 0.1% THD. I primarily use this function for testing speaker distortion so that I can catch failure before it occurs—many speakers exhibit increasing amounts of THD as they age.

GETTING AROUND

Menus, programs and parameters are selected using a single "encoder" knob. Turn the knob to select a file and push it to select the item (if it is a menu choice) or change the value of the field. Some fields are changed by clicking the knob and some by clicking and spinning the knob (the difference is indicated on the highlight line under the selected parameter).

Some screens have shortcut fields for jumping directly from your current function into another, performing the task, and jumping back into the first function without using the menus. Cur-

rently, there are two fields that work this way: the Gen field and the Mem field. On functions that display the Gen field, when you click, you will jump directly to the Signal Generator screen. From there, you can adjust the settings of the internal signal generator, such as the frequency, level or type of signal, and then jump directly back to the previous function.

As stated earlier, the screen is quite small, so you sometimes have to pay very close attention. Numeric readouts and bar graphs are just fine, but some of the high-resolution charts require close scrutiny. The "Plus" version has a larger screen.

A QUESTION OF ACCURACY

The real value of test equipment is not how many functions it performs but whether it performs those functions easily and accurately. I tested the internal mic calibration with a B&K 4231—it was spot on. I then put the Toolbox next to a B&K 2260 Investigator and a Meyer SIM System II. While the majority of readings looked pretty good, I did find a couple of discrepancies with readings between the Toolbox and both the B&K and SIM. I talked to TerraSonde about this, and they said these issues had been addressed in the upcoming software version—these guys are dedicated to the box and respond well to feedback from the more than 1,000 Toolbox users in the field. However, one problem not yet addressed involves using the RTA with the internal mic. I saw a bump at 13 kHz that I attribute to the mic proximity to the body of the Toolbox (the bump did not show up when an external mic was used). I recommend using a good measurement mic for critical HF evaluations.

The only thing that I found annoying about the TerraSonde's operation was a speaker pop when turning the noise signal on and off. TerraSonde says it will address this.

Otherwise, the Toolbox worked well. Stored program defaults make the Toolbox power on to a specific set of parameters I always use when performing certain measurements. Although the box comes factory-calibrated, the Setup and Calibration modes allow you manipulate a vast number of system features. Beware: Unless you're a pro with great equipment, you don't want to mess around with this, but it's useful for calibrating external microphones.

There is not space here to describe all of the Toolbox functions, such as Session Helpers (Instrument Tuner/Tempo Computer/MIDI Helper/MIDI Transmitter/Time Code Tools/Hum Cancellation) and Utility Functions (Monitor Amp/Cable Tester/Phantom & Battery Power Tester). A detailed description of these can be found at www.terrasonde.com.

At $999, the Audio Toolbox is a very good buy. It performs many functions well, and I would encourage all of my clients to have one on hand for those cases when I can't be there in a timely fashion. For small-studio owners who are mostly do-it-yourselfers, it is a good investment that will improve the quality of their studios and help with maintenance. TerraSonde maintains an excellent Web site where you can also download the latest version of the manual and check out the latest hardware availability. The fact that TerraSonde supports both Mac and PC platforms is admirable.

TerraSonde, 1751 Redwood Ave., Boulder, CO 80304; 303/545-5848; fax 303/545-6066; www.terrasonde.com. ■

More than you care to know about Mix *contributing editor Bob Hodas can be found at www.bobhodas.com.*

ALESIS MASTERLINK ML-9600

MASTER DISK RECORDER

MasterLink is a stereo hard disk recorder and 24-bit/96kHz CD recorder with onboard DSP.

As 16-bit audio continues its slide into obsolescence, the pro audio industry looks for an inexpensive, high-resolution replacement for DAT. Listed at $1,699, the Alesis MasterLink aspires to take the baton from tape-based decks and offer a backwards-compatible, high-bit/high-sampling frequency mastering solution with a robust, disk-based delivery format. MasterLink is essentially a rackmountable, stereo hard disk recorder and 24/96 CD burner with onboard DSP. With MasterLink, you can record to an internal hard drive; apply fades, gain changes, EQ and dynamics processing to your material; and burn down-sampled Red Book CD premasters or proprietary-format 24-bit/96kHz CDs for archival, high-resolution playback or transfer to 24/96 DAWs for simplified file exchange.

Given Alesis' overwhelming success at creating industry standards with its Lightpipe and 16- and 20-bit ADAT formats, the question as to whether MasterLink could become the next prevailing delivery format comes to mind. Let's run MasterLink through its paces to see how it holds up.

CONNECTIONS

Aside from the IEC-type, detachable AC cord, the rear-panel connections consist entirely of stereo digital and separate L/R analog I/O. AES/EBU format digital I/O are provided on both balanced XLR and unbalanced co-ax jacks. Balanced, +4dBu analog I/O are provided on XLR jacks. RCA jacks service the unbalanced, -10dBV analog I/O. Word clock input is noticeably absent.

Unfortunately, there are no pre-A/D trims for calibrating the unit with other gear. The balanced I/O clip at +19 dBu and the unbalanced I/O clip at +5 dBV. Most DATs can take +22 dBu. Feeding the MasterLink's balanced analog inputs from my 02R's stereo bus analog outs (0 dBfs out of the console) exceeds the MasterLink's headroom by a hefty 6 dB.

Of course, this is not an issue if you're using external A/D converters with the MasterLink. But aside from headroom, there's no compelling reason to do so, because MasterLink's 24-bit, 128x oversampled converters sound truly excellent.

MasterLink offers two different modes of operation, hard disk and CD, toggled by a front-panel button. Hard disk mode is used to record audio to or play back from MasterLink's 4.3GB internal hard disk, and to create CDs from audio recorded on the hard disk. CD mode is used to play back prerecorded CDs and to copy tracks directly from a CD to the internal hard drive for remastering or compilation purposes. You'll probably be working in hard disk mode most of the time, so let's examine that first.

BY MICHAEL COOPER

RECORDING AND PLAYLIST EDITING

All digital outputs *and* inputs are hot simultaneously, so you'll want to be sure to hook up only the balanced or unbalanced digital inputs—and not both—to avoid data corruption. Front-panel buttons select the input source (analog or digital), sample rate (44.1, 48, 88.2 or 96 kHz) and word length (16-, 20- or 24-bit) for recording to the internal hard disk. You can choose any combination of the above sampling frequencies and word lengths, for a total of 12 different resolutions.

MasterLink organizes data that is recorded to its hard drive into 16 playlists, each of which can contain as many as 99 tracks. The requisite transport buttons are offered: Play/Pause, Record, Stop, Skip Forward/Backward (to the next/previous track) and Scan Forward/Backward (to audition audio at increased playback speed).

Playlists and tracks can be named. You can change the order of tracks in a playlist, delete individual tracks, and write-protect tracks independently of one another. You also have independent control over the length of each gap between successive tracks. The Version 1.0 software I reviewed did not provide for CD-track offsets,

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but Version 2.0—which should be out by the time you read this—reportedly will allow start/end offsets up to 30 frames (per 75 CD frames/sec).

MasterLink provides the user with independent control over each track's gain from -18 to +18 dB, adjustable in 0.1dB increments up to ±10 dB and in 1dB increments beyond. You can also assign different start/end fades and signal processing to each track (more on this in a bit).

Tracks can also be cropped to do destructive "head-and-tail" editing of unwanted noise or dead space before or after each track. Five-second previews of original track start/end points are provided. You move the new start/end points by scrubbing with the forward and backward scan buttons.

A large, vacuum fluorescent, 2x16 alphanumeric display indicates all current values for the above parameters, although you'll have to scroll through numerous pages to see all of the DSP-related settings. Cursor Left and Right, Up/Yes, and Down/No buttons are used to navigate around the display and adjust settings. A time display can be set to show either elapsed or remaining time for a single track or entire playlist. Each track's start and end times and length can also be shown. Remaining hard disk space is expressed in hours, minutes or seconds. The display's left/right metering could be a little easier to see, but offers good resolution and defeatable momentary or continuous peak hold modes. A headphone jack and volume control are also provided on the front panel.

SIGNAL PROCESSING

DSP is applied nondestructively and in real time to individual tracks in a playlist, so it does not affect the original audio files recorded on the hard disk. Also, deleting a track from a playlist does not delete its parent audio file from the hard disk. However, deleting *will* cause all of your DSP settings to be lost for that track. According to Alesis, Version 2.0 software for MasterLink allows backing up tracks in a playlist backup/restore mode. To avoid losing work that may be needed if and when an indecisive client decides to reinstate a deleted track, you'll need to add the track to an alternative playlist—a holding tank for ideas, if you will—and manually re-enter DSP settings before you delete the track from its original playlist. V. 2.0 software is said to allow copying and pasting of DSP settings between tracks on different playlists.

DSP is applied to tracks in six blocks arranged in the following, immutable order: track gain, compressor, parametric EQ, limiter, track fades and normalizer. Individual DSP blocks can be toggled on/off independently. My only complaint is that, for most applications, I would rather have EQ come before compression so that applied boost doesn't undo dynamic range adjustments. That said, MasterLink's dynamics processing and EQ sound downright superb, and the range and incremental control of parameter values will satisfy even the most finicky mastering engineer.

MasterLink's compressor is clean and extremely transparent. Even the hard knee mode is relatively free of amplitude modulation artifacts. Simply put, this is one of the best digital stereo program compressors I've heard.

The compressor offers threshold, ratio, makeup gain, attack, release, key (channel master), knee (choice of hard and four soft knee modes), detect (peak or RMS) and meter parameters. The latter offers six combinations of input/output/gain reduction metering.

Unfortunately, the compressor's makeup gain can only boost and not attenuate, and the downstream EQ block has no output gain control. Whenever EQ boost clips the downstream limiter, you must attenuate levels in the track gain block—necessitating a resetting of the compressor's threshold. It's a minor hassle.

MasterLink's sweet-sounding EQ block offers both parametric and low/high shelving curves. On the downside, there are only three bands and they don't have independent bypasses. But happily, all three bands cover 20.22 to 20.22k Hz in very fine steps, and boost/cut is adjustable in exacting 0.25dB increments. Q is adjustable from 0.1 to 18, making notch filtering and broad tonal shaping a snap.

MasterLink's look-ahead peak limiter is reminiscent of the Waves L1 in that it combines a brick-wall, ∞:1 limiter with a maximizer function for setting your output "ceiling." MasterLink's limiter sounds outstanding. It's extremely transparent and can really beef up a mix.

Fade-in and -out times can be adjusted for each track in 10ms or 1-second increments. Linear fade, normal logarithmic and inverse log shapes are offered, and they all sound very smooth.

MasterLink also offers a real-time (vs. file-based) normalizer, allowing changes to be made *after* upstream signal processing settings are altered.

On my wish list for future software updates: a global bypass for all DSP, and multipoint I/O metering before/after each DSP module (to safeguard against potential clipping at various points along the audio path). Notably, the compressor block already provides such metering.

BURN, BABY, BURN

After you're finished tweaking the EQ, compression and other settings, signal processing is written to each track in a manner similar to "bouncing to disk" in a DAW. The rendered playlist is recorded to a reserved, "invisible" area of the hard disk so that it can be burned to CD multiple times without the need to re-render. Rendering only occurs with Red Book CDs—MasterLink does not render in high-definition 24/96 mode. The time display still shows elapsed/remaining time for a single track or the entire playlist while the CD is being burned, and the current track number also changes to reflect your progress.

MasterLink can read and write both Red Book (16-bit, 44.1kHz) CDs and proprietary CD24 CDs. CD24 discs can be written to and played back at any of the 12 resolutions that the hard disk can record at, and is not limited to just 24-bit/96kHz data. Only disk-at-once mode is supported.

When you write high-resolution audio to a Red Book CD in MasterLink, the audio is automatically noise-shaped and/or sample-rate converted down to 16-bit, 44.1 kHz on its way to CD. However, the high-res audio files on the hard drive remain unchanged. CD24 discs are played back by MasterLink at their original sample rate and word length.

MasterLink writes Red Book CDs at 4x speed and CD24 discs at 2x speed onto standard CD-R blanks. A 650MB disc will hold a maximum of 19 minutes of 24/96 audio, and the recording process takes about 36 minutes.

FILE EXCHANGE

Alert readers will notice that MasterLink has no SCSI connectors. How does MasterLink exchange data with DAWs?

MasterLink's CD24 mode records .AIFF sound files in an ISO-9660 CD-ROM disc format along with propri-

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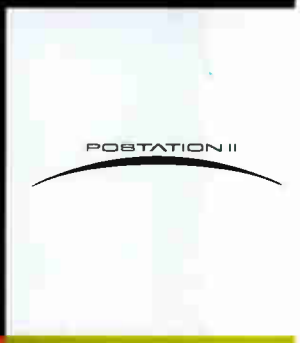

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etary information, making the CD24 discs compatible with CD-R and CD-ROM drives. Most computer-based audio editing programs can recognize .AIFF files, raising the possibility of opening a CD24 disc in a DAW to perform further editing. However, Macs cannot recognize the file type and creator info on CD24 discs made with MasterLink's V. 1.0 software. (This is not an issue with PCs.) This should be corrected with the release of V. 2.0 software, and CD24 discs should be fully compatible with Macs. Both Windows and UNIX operating systems are also currently supported.

How about going in the other direction, from DAW to MasterLink? MasterLink can only recognize Red Book audio or CD24 discs; it cannot read .AIFF files created in a DAW. To transfer high-resolution audio or anything other than Red Book audio files from a DAW into MasterLink, you must play the DAW's audio files in real time and record—preferably via digital I/O—to MasterLink's internal hard drive. MasterLink can also copy individual tracks, one at a time, from Red Book CDs to its hard drive. V. 2.0 software will reportedly be able to copy all CD tracks at once.

CONCLUSIONS

MasterLink provides an enormous yet cost-effective upgrade to outdated DAT decks and CD burners in a portable, all-in-one package. The built-in DSP sounds so good, many users will choose to use it in lieu of their outboard gear and DAW plug-ins. Top-notch sound quality, ultrafine parameter control, support of numerous high-resolution formats, backwards compatibility and the robust error correction of the CD-ROM format give MasterLink a strong shot at establishing a new industry standard for master delivery and archiving. File exchange issues should be resolved with the release of V. 2.0 software, leaving the analog front-end's limited headroom as the only major barrier to full professional acceptance. If you can work around that, MasterLink is a slam dunk.

Alesis, 1633 26th St., Santa Monica, CA 90404; 800/5ALESIS; www.alesis.com. ■

Michael Cooper is the owner of Michael Cooper Recording, located outside the small resort town of Sisters at the base of the Oregon Cascades.

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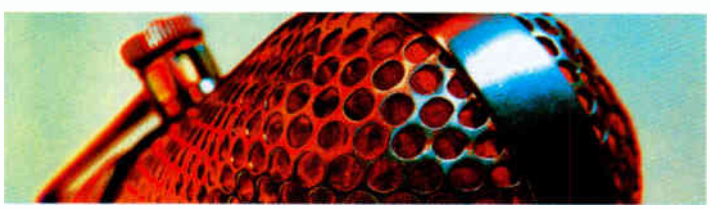

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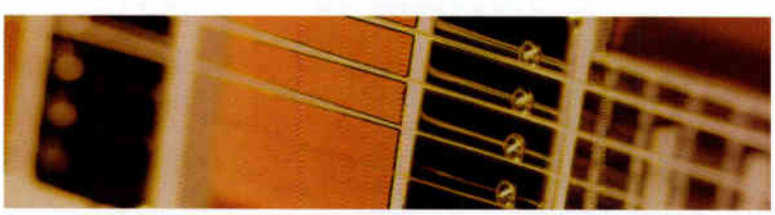

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BIAS PEAK 2.1

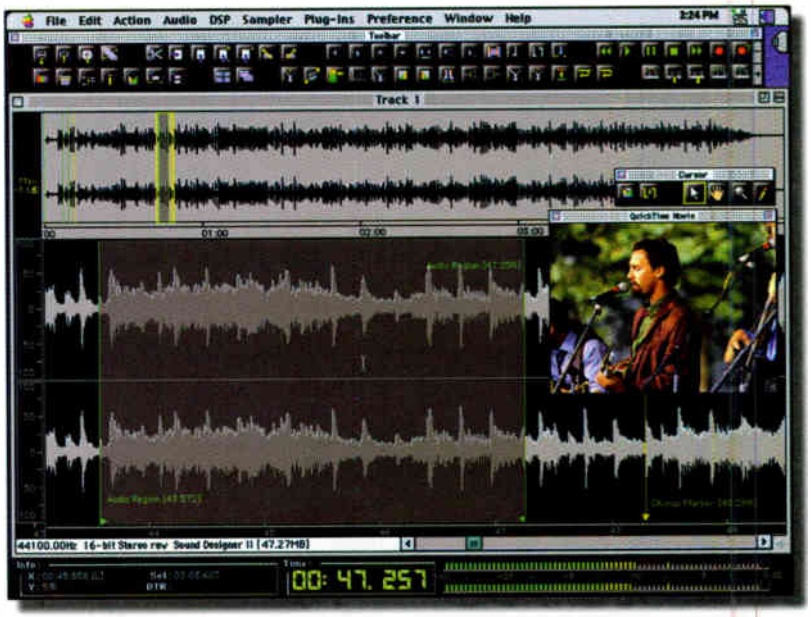
SOUND-EDITING SOFTWARE FOR MACINTOSH

Four years ago, a small Northern California company called Berkley Integrated Audio Software (named for its president, not the city), or BIAS, came out with what might be called the first modern audio-design and editing program for the Macintosh. It was a product that was sorely needed—Digidesign's Sound Designer, by then 10 years old, was getting awfully long in the tooth, and the only comparable program, Donny Blank's Alchemy, had dropped out of sight when the last of a series of publishers, Passport Designs, discontinued it not long before they themselves bit the dust.

Alchemy (while still in many respects a very cool program, with an honored place on my hard drive) is today long gone, but Sound Designer, despite regular reports of its impending demise, is still available. For some of us, particularly those using older Digidesign gear, Sound Designer remains useful for quick-and-dirty editing, file format changes within a small universe, and other such straightforward tasks, and I for one would not give it up quickly, either as a production tool or a teaching tool. (Its visual FFT displays still give me goose bumps.)

Peak started out by deliberately filling in the gaps left by Sound Designer. Whereas Digidesign's product was entirely disk-based and performed most of its functions by literally chopping up disk files and moving them around, Peak, recognizing that people have a lot more disk space and RAM than they used to, uses a combination of disk access and RAM processing to manipulate sounds more quickly. It also does so nondestructively, even when it's using hard disk space, thanks to its inclusion of a "scratch disk" feature. So it's hard to make a mistake with Peak, since nothing gets carved in stone until you tell it to.

From the outset, Peak could do



BIAS Peak's waveform editing screen

sample transfers from the Mac to hardware samplers, using both the impossibly slow MIDI Sample Dump Standard and the much more useful SMDI. Sound Designer (which, historians will recall, actually began life as a visual editor for the Emulator II) had dropped that particular ball, and so the new software immediately gained a loyal following within the sampler community.

Other features that Peak brought to the table were a far larger choice of file formats to save to and load from; unlimited Undos with an Edit History window, which lets you travel back in time through your editing operations and at any point change your mind and choose the road not taken; digital extraction from audio CDs (actually part of QuickTime, but made easy in Peak); batch processing; AppleScript support; and since it couldn't easily use Digidesign plug-ins, support for Premiere plug-ins, a format that started out as a "kid brother" to Digidesign but now boasts some pretty impressive tools.

BY PAUL D. LEHRMAN

THE LATEST REVISION, VERSION 2.1

Filling the gaps left by Sound Designer is no longer a priority—a greater challenge to the designers of Peak has been keeping pace with the formidable progress made on the PC side of the audio world by programs like Cool Edit Pro and Sound Forge. Which they've done: Peak remains a thoroughly modern program, with a terrific feature set.

In fact, it is now three programs: Peak LE ($99) is the entry-level "lite" edition, which can also be found bundled with a number of other programs like Adaptec's Jam and Macromedia's Director; the "professional" version is just known as Peak 2.1 ($499); and Peak 2.1-TDM Edition ($699), for Pro Tools owners who want to be able to keep using their collection of TDM plug-ins. Except for the LE version, Peak supports Digidesign's DAE (the audio engine used by Pro Tools hardware) and AudioSuite plug-ins. So in an atmosphere in which other manufacturers, in an effort to save money, are withdrawing from Digidesign hardware support, it's good to see BIAS

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working to keep all of its user base happy. All three versions support the now-healthy family of Premiere-compatible plug-ins, like Peak's own SFX Machine, a very comprehensive suite of processors, a demo version of which is included. They also support Steinberg's ASIO protocol.

Peak was always good at dealing with a large variety of file formats, and the new version extends that capability. It can import all the standard Mac formats, with up to 32-bit word lengths, and sampling rates of 96 kHz or even higher (if your hardware supports it), plus .WAV and various older compressed formats; the program developers at BIAS also say that it imports MPEG-3 files, but that was not mentioned in the manual, so that was not part of my test. However, like most other stand-alone audio editors, it does not support RealAudio. The output side however, is very flexible: You can save as RealAudio, with a full array of optimization choices for various bandwidths; MP3; Shockwave; Ensoniq PARIS format; JAM, for Adaptec's CD-burning software; and even Sonic Solutions' peculiar flavor of .AIFF, which can save a lot of time if you're exchanging files with a Sonic system, since the latter's conversion of standard .AIFF files is quite slow. A caveat, however: To do MPEG-3 and Shockwave, you have to download a plug-in from Macromedia's Web site called SoundEdit 16 SWA Updates, and drop it into Peak's plug-ins folder. The URL for the file is provided, but the procedure is pretty confusing, and the odd nomenclature doesn't help.

The RealAudio export, in a quick test, worked well, and the results using a stereo 32 kbps bandwidth setting were completely respectable. On the other hand, the MPEG-3 conversion is disappointing: The procedure is ridiculously slow, at least on my 266 MHz G3, 17 minutes for a six-second stereo file, and the sound quality when set to 56 kbps is disappointing. After I completed my testing, BIAS' staff told me that turning the disk cache way down would speed the encoding process considerably, without any decrease in sound quality. It would have been nice if this quirk were documented somewhere, and then I would have had a chance to try it.

PACKED WITH FEATURES

The list of features that Peak has crammed into this software, both visible and "under the hood," is pretty impressive. Simple cut-and-paste edits can optionally use a blending envelope that can be of any length, with user-definable fade ins and outs. Two modes of scrubbing are available: the usual tape-style, where the sound slows down and speeds up, and "dynamic" scrubbing, which is more like frame-based editing. As you move the cursor, little pieces of audio (you define the length) are looped, so you can pinpoint and lock onto a particular audio event very precisely. It's not pretty to listen to, but it works really well.

Amplitude Fit is a feature borrowed from Alchemy: You draw an amplitude envelope, and no matter what the envelope of the original file looks like, it changes to match your new envelope—sort of like a supercrunching limiter with automation. The Duration Change function allows you to specify the new length in tempos and beats. Modulate combines two files like an old-fashioned ring modulator, and Convolve analyzes the spectral content of a sound you place on the clipboard and applies it to the current file, which serves to reinforce spectral elements that the two have in common.

Repair Clicks does an admirable job of finding and eliminating clicks, and gives you a comprehensive, if initially a little confusing, set of parameters to play with. The program displays a pair of large, fast bar-graph meters, whose sampling speed, peak-hold and clip-indicator times can be adjusted. And the program will now play back audio locked to SMPTE/MTC, with an adjustable re-sync parameter for dealing with timecode drift.

One of my favorite Peak functions, which dates back to early versions, is Threshold. This feature acts like a gate in that you can specify an attack and release threshold and gain setting, and a minimum duration time, but instead of processing the file, it inserts markers at points where the "gate" would open and close, thereby intelligently breaking the file up into regions. As you adjust the parameters in one window, you can see the markers being created in the main window, so getting the settings right is quick and intuitive. Once you've got those markers in place, you can export each region into its own file.

Peak's support of MIDI samplers has become much more stable. Formerly, complex SMDI networks could confuse the program, and if you didn't specify your source files and targets in the sampler absolutely correctly and consistently, the program wouldn't help you out, and in fact would often crash. The new routines make it much easier to get those numbers right, and the program is far more forgiving of both human and electronic error. Code for dealing with specific Akai, E-mu, Ensoniq, Peavey, Kurzweil, Roland and Yamaha SMDI-compatible samplers is now included, and my tests with a Kurzweil K2000 and a K2500 went perfectly.

Loop functions have improved as well: The task of finding loop points is helped greatly thanks to, along with standard Loop Tuner and crossfade loop functions, something called Loop Surfer, which creates a loop according to user-specified beat lengths and tempo. And if you don't know the tempo of the file you're looking at, a Guess Tempo function analyzes the peaks and troughs in the waveform and figures out—reasonably successfully—what the tempo is.

Another of Peak's most attractive capabilities is its Batch Processing feature. You can set up any number of input, processing and output options, save them as a "script," and then, simply by dropping files from the desktop onto Peak's icon (or an alias), all the files will be processed and dumped to the folder of your choice, while you go and have lunch. The interface is not quite as clear as it could be, but once you figure it out, you can do some very slick moves like import a dual-mono file, normalize it, knock out everything above 10 kHz, and save it as a RealAudio 5.0 stereo file (with the proper file extension) on a different disk.

Along with all the new features, the user interface has undergone a radical change, with "Goo"-like controls in a Toolbar that stretches across the entire screen. The buttons are a little too small and their icons a little ambiguous for my taste, but a welcome touch is that when you move the mouse over a button, a text window at the bottom tells you what the tool does. You can customize the Toolbar, or if you find it really annoying, you can simply hide the whole thing and use the menus and keyboard shortcuts. You can customize your own keyboard shortcuts and make a little "cue card" text file you can print out (there's a Filemaker template for this included).

HARDWARE ISSUES

If you have used Peak in the past with Digidesign hardware, you probably know that the program and Digi stuff haven't always gotten along well togeth-

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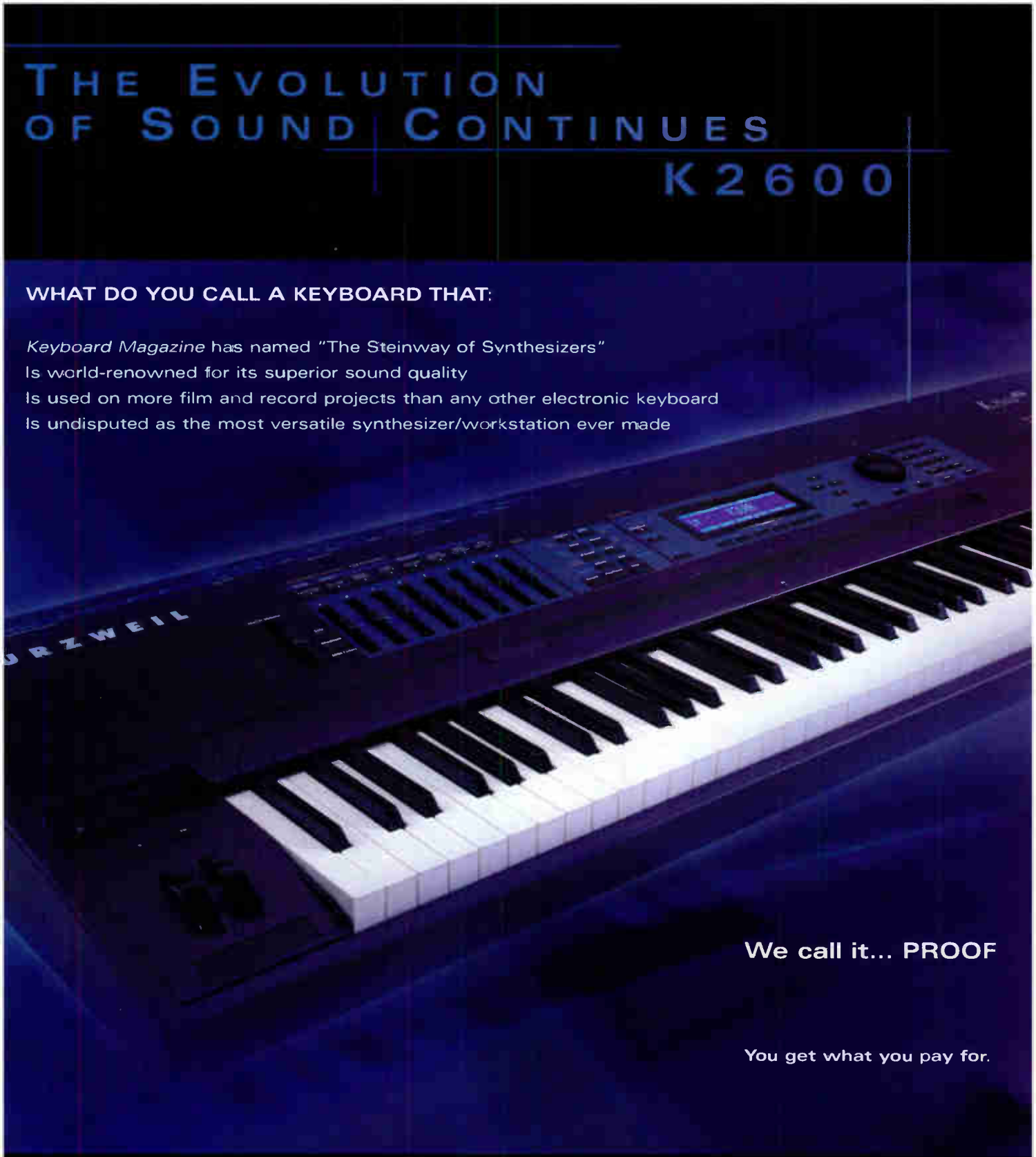

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er. In previous versions, when playing audio from an Audiomedia card or Pro Tools system, you had to use Apple's Sound Manager, and get the appropriate drivers from Digidesign. Dealing with incompatibilities between various system versions and extensions to get Peak running was like putting together a moving jigsaw puzzle, and in my experience it never worked perfectly; often, weird clicks or buzzes would get into the playback, although the files themselves were never affected. In 2.1 (except for the LE version), BIAS has finally included direct DAE support, and those particular playback issues are gone. But unfortunately, now there are other problems. For one thing, you can't use dynamic scrubbing with DAE. Even more inconvenient, Peak's native file format is not compatible with DAE, and so every time you import, process or save a file, Peak has to create a DAE Play file, so that you can hear what you're doing. This slows the program down enormously; in effect, it doubles the time it takes to do any operation. There is an ASIO driver available that is supposed to work with Pro Tools systems, which presumably would avoid these problems, but even after several weeks of trying to get it to work with my venerable Nubus-based Pro Tools III hardware, and many calls to the company, I could not get it functional. The folks at BIAS say that Digi's DAE technology is at fault; it simply can't deal with stereo files, but that doesn't solve the problem.

The ASIO driver for the Audiomedia card, on the other hand, works flawlessly. It even lets you do something that previous versions couldn't: play an audio CD in the Mac's CD-ROM drive through the Audiomedia's outputs. The only problem there is finding the damned driver: It's not on any Web site, not BIAS', nor Digi's, nor Steinberg's. Instead, it's buried deep in Steinberg's FTP site, where there are no links to it, and a search for "Audiomedia" will get you nowhere, since Steinberg decided to spell it "Audio Media."

In the TDM version of the software, TDM plug-ins generally work well. Unlike in Pro Tools, these plug-ins in Peak are static; you can't change any effects settings over time. Also, when you pass a signal through a plug-in, it doesn't process it on-the-fly, like Pro Tools. Instead, when you have all of the modules set up the way you want, you "bounce" the effected file to a new file. You can close the audio document without closing the plug-in windows, so you can use the same modules and settings on as many other files as you wish, which is an excellent feature. I did have some trouble with a few plug-ins, where the program would crash with a Type 1 memory error, although I had allocated a 36-meg partition for it.

AudioSuite plug-ins are even more problematic. Perhaps I just need to get newer versions, but on my system some of the modules aren't drawn correctly on the screen, with the result that crucial items like the "Process" button don't show up. In none of the AudioSuite plug-ins could I get the Preview button to work, even when I could see it.

Besides the hardware problems, I have some other small bones to pick with the software. Sometimes when fading a file out at the end, the software leaves a click, which shows up visually as a small, sudden level jump (or DC offset) in the last sample of the file. No matter how much you zoom in, you can't erase it. You can, however, draw it away with the pencil tool, but this is a painstaking operation that shouldn't be necessary.

Some operations, like importing a dual-mono file and some DSP functions, cannot be stopped once they start. If you make a mistake and tell the program to do something horribly complex on an entire 10-minute file, when what you really wanted to do was just work on the first five seconds, most of the time you're stuck waiting for it to finish. Of course, you can undo it afterwards, but that's a lot of time wasted. I sometimes found myself force-quitting the program and rebooting the Mac (a dangerous practice, to be sure) when I ran out of patience.

The manual is pretty good, although it could use a good copy edit and a better index, but since software versions change so fast, whichever bound manual you receive will be out-of-date, and you'll find yourself constantly consulting an addendum. (And for the last time: A program this complex needs a manual with a spiral binding, which can stay open and lie flat, not a tight glue binding that slams shut when you look away for a millisecond.) Actually, you'll probably be better off using the enclosed PDF versions, so that you can take advantage of Acrobat Reader's search function.

On the philosophical/ergonomic side, there's an "all operations are equal" approach to the design that I find hard to like. Maybe I'm too right-brained, but I prefer programs that are designed hierarchically, with more important or common functions easier to get to, and more esoteric ones buried a little deeper, although in logical places. I found myself constantly looking for the same menu items over and over, because there's no real structure to how they're organized, and I could never remember where functions were. This is a problem that's become increasingly common as sound- and music-editing programs (not to mention every other type of software) have grown so much more complex and feature-rich, and I give points to BIAS for making Peak as customizable as it is, but it's still something that they might consider further.

Despite these annoyances, Peak 2.1 is a mature, capable, eminently usable and useful program, with a feature set that will keep you happy for a long time. No Mac audio professional should be without it—period. Just make sure that if you're trying to integrate it with Pro Tools, you have access to good tech support from both companies, and you are willing to put some time into finding the right way to configure your system.

BIAS, 1370 Industrial Ave., Suite A, Petaluma, CA 94952; 707/782-1866; fax 707/782-1874; www.bias-inc.com. ■

AUDIO-TECHNICA AT4047/SV

CARDIOID CAPACITOR MICROPHONE

BY ROGER MAYCOCK

For nearly 40 years, the people at Audio-Technica have been dedicated to the advancement of electroacoustic design and manufacturing, establishing an enviable reputation for building good-sounding, reliable products. The company's microphones, in particular, can be found in leading studios worldwide.

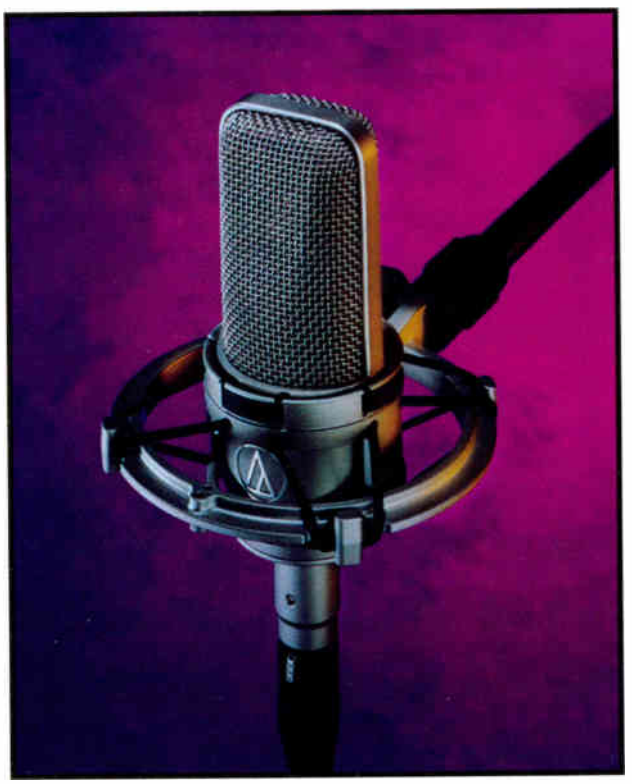
A-T's latest large-diaphragm, cardioid capacitor microphone is the AT4047/SV, intended for critical recording and broadcast applications. The microphone has a gold-plated, XLR-type connector and ships in a foam-lined case with a matching silver-colored shock-mount. Options include the AT8137 large cylindrical foam windscreen, a variety of cables and the AT8430 stand clamp.

This 48V phantom-powered mic is housed in a matte-silver-finished cylinder body that's 6.69 inches long, with a maximum body diameter of 2.1 inches, and a weight of 14.5 ounces. The instrument has a frequency response of 20 to 18k Hz, a signal-to-noise ratio of 85 dB (1 kHz at 1 Pascal), and an A-weighted noise rating of 9dB SPL.

The AT4047/SV was designed to produce a sonic quality reminiscent of early FET studio microphones, employing a transformer-coupled output. The capsule's dual, 2-micron-thick, vapor-deposited, gold diaphragms deliver a dynamic range of 140 dB and improve the microphone's ability to provide undistorted reproduction of high SPL signals. These diaphragms are aged using a proprietary five-step process to ensure consistent performance over years of use. Internal shock-mounting isolates the capsule from noise and vibration.

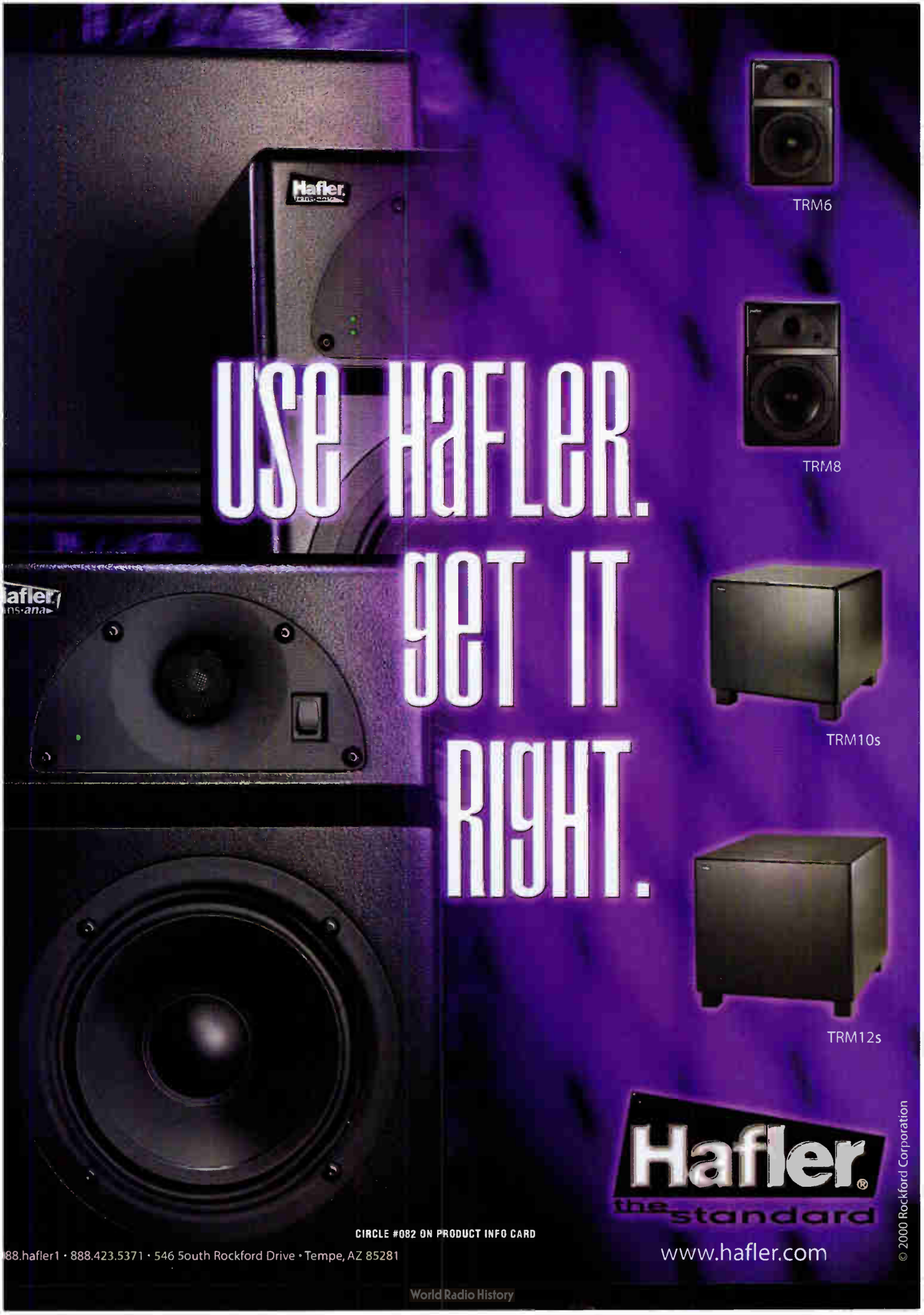
The mic's frequency response is quite flat through the upper midrange, at which point there is a slight bump of roughly 2 to 3 dB at about 5 kHz. Set to the Low Cut position, a 12dB/octave (at 80 Hz) low-frequency roll-off reduces the mic's sensitivity to vocal popping in close-miking applications or to low-frequency ambient noise. A pad switch increases the microphone's SPL capabilities by 10 dB.

The AT4047/SV has the look and feel of a quality instrument. Further, the shock-mount adapter is one of the best I've encountered. The microphone drops into the shock-mount's center well and is secured by a latex band that gently surrounds the lower portion of the instrument's main cylinder. This leaves just enough room for access to the Low Cut and Pad switches. Once in the shock-mount, the microphone has a secure resting place, yet this arrangement is more "fluid" and provides better mechanical isolation than the shockmounts I've seen from most other manufacturers.



My first sessions with the AT4047/SV were for dialog and vocal recording. The symmetrical housing assembly surrounding the microphone's capsule and its open acoustical environment facilitates a broad off-axis response that is ideal for vocal and instrumental recording. The microphone does not, however, provide a fine-woven inner headscreen. Consequently, it's very important to use a high-quality, sheer nylon pop filter—especially for close dialog work. Without it, popping and sibilants are likely to require a fair amount of editing.

For the dialog session, the microphone was positioned just slightly above the speaker's mouth, with the pop filter directly in front. With the talent speaking roughly four to six inches from the capsule, I was able to acquire very full, even-sounding dialog takes that exhibited almost no objectionable sibilance. I experimented with the Low Cut switch to determine whether I could reduce the small amount of low popping sounds that I was experiencing. While the Low Cut made a significant improvement, it also reduced the "fullness" of the



FIELD TEST

NEUMANN KMS105

CONDENSER MICROPHONE

The Neumann name is synonymous with fine studio microphones. However, Neumann is no stranger to live sound microphones; in fact, its KMS140 and KMS150 handheld condenser models have been available for nearly a decade. Unfortunately, at approximately $1,500, the KMS140/150 is a little pricey for the average band or sound company. Now Neumann has addressed the affordability issue and has produced a competitively priced live mic: the KMS105 cardioid condenser.

Available in either nickel matte or black matte finishes, the 105 retails at $595. Included in the package is a clever, nylon-and-Velcro padded bag that wraps around both the mic and the stand clip, offering a high degree of protection. Speaking of the clip, the 105 fits snugly into a standard-sized clip, which simplifies onstage setups/breakdowns. Unlike the more costly KMS140/150, the 105 does not include switchable highpass filters or pads. SPL handling is rated at an ample 150 dB (at less than 0.5% THD), while the mic employs an internal (nonswitchable) bass roll-off circuit that attenuates a gentle -3 dB from 120 Hz downward. A steeper filter cuts signals below 100 Hz to keep handling noise to an absolute minimum.

The phantom-powered condenser capsule is a supercardioid design, based on the K 50 capsule used in the KMS150, KM150 and KM185 mics. Featuring the proven electronics used in Neumann's FET 100 Series, the KMS105 offers a wide frequency response and low (18 dBA) self-noise spec. The output is transformerless, which is well-suited for the ultralong cable runs frequently encountered in sound reinforcement applications.

A four-layer acoustic pop filter not only protects the capsule from grit, saliva and other road hazards but does a superb job of handling pops and breath blasts. No foam material is used in this application: The outer grille is formed of woven hardened steel, with a tight, inside metal-mesh dome and a fine-weave, mesh-covered basket. The outer screen assembly unscrews easily for cleaning, and the inner mesh basket is removable for a light dusting or replacement.

In use, the 105 proved to be an impressive mic with a character all its own. Its high-SPL reproduction capability and effective plosive handling (combined with the onboard highpass filtering) are characteristics ideal for vocalists, and the controlled proximity effect suits singers who like to work the mic close. The mic has a full sound but is free of boominess or overload distortion—no need to worry about exaggerated low-frequency buildup or destructive vocal pops. Handling noise was unnoticeable.

Overall, the 105's supercardioid pattern is remarkably consistent at all frequencies, a feature that reduces the chance of feedback. With a pair of wedges set about 45° off-axis from the rear of the mic, feedback was nearly nonexistent and was easily tamed with minimal monitor mix EQ. In terms of polar response, the 105 strikes a nice balance: The tightness of the pattern offered plenty of off-axis rejection, while the width of the pattern afforded a comfortable sweet spot for the performer.

The capsule provides an uncolored sound with a wide, even frequency response. A slightly rising HF peak centered around 12 kHz brings out the sound of the voice, rather than the mic. But the 105 does not have the huge upper-midrange boost that's common to many handheld vocal mics, and singers that depend on that presence punch will probably be disappointed with the 105's sound—or lack of "sound." However, for the performer with clarity and articulation, the open and natural character that the 105 imparts to an outstanding vocal will be appreciated by those with the ears to hear it.

Neumann USA, 1 Enterprise Dr., Old Lyme, CT 06371; 860/434-5220; www.neumannusa.com. ■

BY GEORGE PETERSEN

The Revolutionary Way to Mix, Master and Make CDs

MASTERLINK™

ML-9600 HIGH-RESOLUTION MASTER DISK RECORDER

The new MasterLink™ ML-9600 high-resolution recorder is much more than just a mixdown deck or CD burner. It's a visionary product that will completely change your perspective on two-track audio, and redefine the way you master your mixes.

Combining hard disk recording, DSP and the world's most advanced CD-R format, MasterLink offers you an all-in-one system for creating polished, fully mastered CDs. And with its unique high-resolution capabilities, MasterLink makes it easy to deliver and archive two-track mixes – up to 24-bit/96kHz – using convenient, inexpensive CD-Rs.

Fully compatible with standard CD and AIFF audio formats of today, it delivers the advanced digital quality you'll be using in the years ahead. But why wait? Visit your Alesis dealer today and join the MasterLink revolution.

Hard Disk Recording

Record your two-track mixes onto MasterLink's internal hard drive with your choice of digital resolution...from standard 16-bit/44.1kHz resolution all the way up to 24-bit/96kHz.

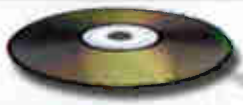
Custom Playlists

Create 16 different playlists containing up to 99 songs each ...with full control of song order, track gain, fades and more.

Dynamics Processing

Use MasterLink's compression, limiting and normalization to optimize each song's dynamics.

CD Creation and Playback



Record your master to CD-R. MasterLink creates standard 16-bit/44.1kHz Red Book CDs as well as AIFF-compatible hi-res discs up to 24-bit/96kHz.

Professional Equalization

Fine-tune each song with MasterLink's 3-band, fully parametric EQ.

Alesis Corporation 1633 26th Street Santa Monica CA 90404 800-5-ALESIS
MasterLink is a trademark of Alesis Corporation.

ALESIS

CIRCLE #085 ON PRODUCT INFO CARD

SNAPSHOT PRODUCT REVIEWS

CEDAR BRX+ AND AZX+ ▲
Debuzzer and Azimuth Correctors
Cedar has expanded its acclaimed X Series of audio restoration modules (DCX Declicker, CRX Decrackler and DHX Dehisser) with two new units, the BRX+ Debuzzer and AZX+ Azimuth Corrector. Priced at $6,555 (BRX+) and $5,695 (AZX+), these single-rackspace boxes can be used alone or daisy-chained in any combination, and feature 40-bit, 50MFlops floating-point CPUs for real-time processing.

There is no analog I/O, but all are equipped with S/PDIF (co-ax) and AES/EBU digital I/O, and provide 24-bit I/O resolution at any sample rate from 30 to 50k Hz. The front panels on both units belie the fact that there's a lot going on within their central CPUs, but keep operations simple.

The AZX+ Azimuth Corrector fixes the timing differences created by azimuth errors and electronic faults in the signal chain. Not just for tape recorder head correction, the AZX+ also works with any signal where the phase alignment of the L/R sides are off, such as phono recordings where the cartridge is misaligned. In automatic mode, a tracking algorithm locks onto these errors, and AZX+ synchronizes the channels with an accuracy of 0.25 samples. A manual mode permits timing shifts as small as 0.01 samples. As azimuth correction has a major effect on stereo perspectives, the pre/post processed input can be monitored as a stereo, mono summed (L+R) or mono difference (L-R) signal.

On material exhibiting left/right timing errors, the AZX+ did an absolutely amazing job of restoring the stereo image and mono compatibility of the signal. And lest you think that azimuth correction is simply a mono concern, problems such as propagation delay (where only one side of the signal is affected) can crop up in digital recordings, and I have found numerous commercial CD releases exhibiting problems stemming from a misaligned playback deck. Once such recordings are archived to digital, the errors are there to stay, unless corrected, making the AZX+ an indispensable tool for the mastering/archiving facility.

Unlike a simple notch filter, the BRX+ debuzzer automatically identifies all the harmonics that form buzz and hum, such as AC power hum, dimmer noise and camera sounds, and removes them with virtually no effect on the input signal. In addition to film/video dialog restoration, applications include improving surveillance tapes and other forensic recordings. The BRX+ offers a combination of methods using either presets (at frequencies where hum tends to occur) or at any user-defined fundamental from 24 to 130 Hz. From there, the system will automatically track any minor frequency fluctuations in the noise, and the user simply adjusts the "buzz power" and attenuation pots until the desired effect is attained.

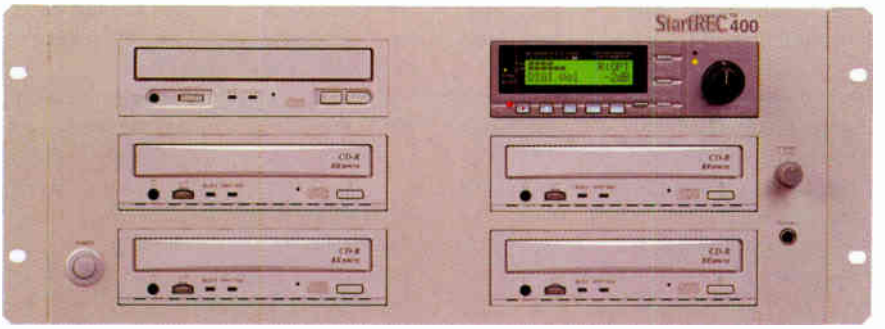
I used the BRX+ on a variety of material, both audio and video, including U-matic and vintage EIAJ reel-to-reel black and white tapes I was archiving to digital. The BRX+ made a enormous improvement in clarity on several recordings that otherwise were essentially unusable. On another session, the BRX+ rescued a telephone interview where the cassette recorder sat next to the back of a computer monitor and was awash in hum from the CRT's choke. In every case, the BRX+ reduced or eliminated the offending noise (and its harmonics) while leaving the original unaffected.

Cedar, distributed by Independent Audio; 207/773-2424; www.independentaudio.com.

—George Petersen

CAD VSM ◀
Cardioid Tube Microphone
Made entirely in the USA, the VSM (formerly dubbed the VSM 1) tube condenser mic features CAD's patented Optema capsule, a 3-micron, 1.1-inch diaphragm, an input stage with a hand-selected, "burned-in" 12AX7 tube and a solid-state output stage. The pickup pattern is cardioid. A -3dB-at-80Hz highpass filter and a -8/-16dB pad are standard.

With an attractive silver gray body with matte-black trim, the VSM has an art-deco look and includes a custom flight case, a well-designed shock-mount, power supply and cable. The case holds



the VSM mounted in the shock-mount as a single unit, saving the hassle of taking the shock-mount on and off during setup/breakdown. The rugged external power supply is switchable to 117 or 220 VAC. The 30-foot, 7-pin mic-to-power supply cable is high-quality Gotham cable with gold-plated Neutrik ends.

The VSM's frequency response is rated at 10 to 20k Hz (impressive, especially to my dog, Bud). The mic has very low self-noise, especially considering it's a tube mic. The numbers support what I heard, or more specifically, what I didn't hear; S/N is rated at 79 dB at 94dB SPL.

The VSM is neutral sounding with a clear mid-high response. There are a few subtle bumps and dips in the midrange but nothing unacceptable. The low end is light and unobtrusive, surprising for a tube mic. Its generally flat response yields the sense of a mellow high-end rise starting at around 11 or 12 kHz that's quite pleasant. There is, however, a smearing proximity effect starting around six inches and closer, making the VSM's sweet spot just beyond that point, and about seven inches from the capsule was ideal.

The VSM is particularly complementary to edgy voices, as it tends to smooth out the sound. Sibilance is handled beautifully; tracks recorded with the VSM should need only minimal deessing. Certain types of percussion instruments (shakers, cuicas, bean pods, etc.) also record very well. The mic imparts an airiness to their transients that sit nicely in the mix. It's not my first choice on acoustic guitar—I prefer a smaller diaphragm like Neumann's KM54 for better presence—but the VSM would do in a pinch. For overheads, I suspect this mic would work great, but, unfortunately, I only had one VSM for review.

With a list of $1,299, the VSM is a great value, offering VX2 technology in an affordable package. I'd even recommend it over some models that cost much more, but if a large-diaphragm condenser mic with heavy tube color is what you're looking for, the VSM probably isn't for you. Its strong point is its uncolored sound, its translucent quality: not things everybody will like, but qualities that help define it as a welcome addition to mic lockers in project and pro studios alike.

CAD Microphones; 440/943-0110; www.cadmics.com. —*Michael Denten*

HOEI PRECISION STARTREC 400 ▲
Digital Audio Recorder, Editor and CD Duplicator

StartREC 400—which ships with a Plextor 40X CD-ROM, 6GB internal IDE drive, and four Panasonic 8x CD-R recorder drives—is the first professional digital audio editing system joined with a high-speed, multidrive CD-R duplication solution.

Housed in a four-rackspace package that weighs 35 pounds, the StartREC rack includes a 33-page reference manual that takes less than an hour to digest, thanks to an easy OS and trouble-free operation. Each of the drives has its own headphone miniplug and volume control, and a master ¼-inch headphone jack with volume control and audio edit interface round out the front panel. StartREC's rear panel has one AES/EBU and two S/PDIF (coax and optical) digital ports, with stereo XLR balanced and unbalanced RCA analog I/Os.

Divided into three partition blocks for managing simultaneous projects, the internal 6GB IDE drive is the first audio target when extracting songs from CDs, transferring digital audio, or recording fresh analog tracks with StartREC. Once on the internal hard drive, tracks can then be moved, deleted, divided, combined, re-indexed, and faded in or out en route to one or all of the CD-R recorder drives. Including any one of three SCMS copy-protection levels (none, 1X digital copy and fully prohibited) is up to the user, and StartREC can read and copy from CD-RW discs, as well.

The compact digital audio editor interface has CD-like transport controls, various menu, display and edit switches, concentric L/R record level rings and a 2x16-character LCD screen for accessing StartREC's well-organized edit menu hierarchy. The latest 1.0e firmware provides an audio verification feature as well as nondestructive program playlist editing. StartREC can write Track at Once and Session at Once CD-Rs, and it can automatically or manually rearrange, add and delete track markers, and convert 32/48kHz files to CD standard 44.1 kHz.

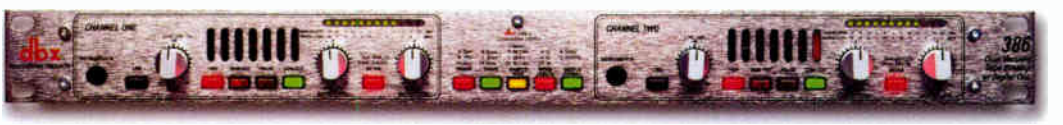
StartREC couldn't be easier to use or earn a quicker return-on-investment for its $3,995 price tag. I was able to digitally transfer, rearrange, and burn five master tracks from a Mac down to CD-R in less than 30 minutes with StartREC. Creating a compilation CD from numerous CD-RW session disks was easy, and the rackmounted 400 was perfect for recording a live stereo mix and burning CD-Rs at a friend's gig before the drummer was finishing breaking down his kit. If you're building a short-run CD duping business, transferring digital audio to CD-R, recording fresh stereo tracks, or all of the above, check out the StartREC 400.

Hoei Precision, distributed by Microboards; 800/646-8881; www.microboardsproaudio.com.

—*Randy Alberts*

DBX 386 ▼
Dual Vacuum Tube Preamp With Digital Out

The 386 Dual Vacuum Tube Preamp is a single-rackspace mic preamp that delivers exactly what its name specifies. In addition to serving as a conventional



tube mic preamp in the analog domain, the 386 provides both AES/EBU (XLR) and S/PDIF (RCA) digital ports that can route your mic signal directly to your digital recorder/DAW at sampling rates as high as 96 kHz with selectable 16/20/24-bit word lengths.

Features include selectable dither and noise shaping, word clock sync

I/O, 12-segment LED meters, plus separate analog and digital output controls. Further, the unit has 60 dB of input gain, 15 dB of output gain, selectable mic/line inputs, a 20dB pad, phase reverse switch, a 75Hz lowcut filter and 48V phantom power. The 386 also employs dbx's proprietary Type IV conversion process, which combines the best attributes of digital conversion and analog recording processes to preserve the character of the analog signal when it is converted to a digital format.

I used the 386 in conjunction with an Audio-Technica AT4047/SV mic (also reviewed in this issue), feeding analog line level signal to my Tascam TM-D1000 digital mixer with an IF-TAD interface, and from there via a Frontier Design Wavecenter audio card to Sonic Foundry's Vegas Pro. The unit's operation is intuitive, and I had plenty of headroom. For digital operation, I bypassed the mixer and went straight to the computer via S/PDIF. After selecting the appropriate sampling rate, output format and word length, operation went without a hitch.

The dbx 386 is a versatile mic pre that facilitates both analog and digital connections with a wide variety of equipment. Its controls have a secure feel, and there are plenty of parameters for obtaining a sound that is likely to please all but the most finicky of ears. At $599.95, the dbx 386 offers a lot at a reasonable price.

dbx Professional Products; 801/568-7662; www.dbxpro.com. —*Roger Maycock*

LAFONT LP-22 ▲

ADR/Foley Processor

Here's a product whose name is somewhat of a misnomer. Although the LP-22 is designed specifically for recording Foley, ADR and dialog in a studio setting, this single-channel, single-rackspace preamp/compressor/limiter/expander/gate with high/lowpass filters is equally suitable for any situation requiring high-quality audio processing.

Front-panel controls include phase reverse, -20dB pad, 48 VDC phantom power, sweepable highpass (35-600 Hz) and lowpass (20 to 1k Hz) filters, a 20-65dB gain pot and a +10dB gain boost switch. The dynamics section has pots for threshold ratio, release time, gain makeup and de-esser frequency, along with switches for selecting ultrafast attack (100 µs), stereo linking and external key input bypass switches for the various dynamics functions. To keep noise buildup under control—or simply for basic gating—the expander/gate has dedicated threshold, range and release pots, and switches for fast attack, gate/expander in/out and a switched input for frequency selective keying. The back panel has six (pin-2 hot) balanced XLRs for mic in, insert send, line in/insert return, compressor key, expander key and compressor out.

In session, the LP-22 proved to be a flexible performer with impressive audio specs extending well beyond 40 kHz, with EIN better than 128 dB—no surprise, as Lafont is renowned for its high-performance/low-noise film mixing and transfer consoles. The preamp is neutral and transparent, and anyone who records with low-output ribbon mics or ultralow-level sources (gum wrapper Foley, anyone?) will appreciate the high gain switch's extra 10 dB of boost.

The preamp section can be used stand-alone (patched directly out), inserted to external gear or sent directly to the unit's dynamic section—offering a variety of connection options. And whether fed from the onboard preamp or a line source, the compression is smooth, becoming noticeable only at its most extreme setting. The key input worked seamlessly for ducking voice-overs over music beds, and the de-essing function was natural, whether keyed internally or via an outboard EQ. Both gating and expansion were flawless in operation and cleanly handled any noise floor artifacts created by heavy-handed compression.

The unit's main downside is that there's a lot packed into this single-rackspace chassis, and the fine writing on the control labels can be hard to read for us old engineer types. Fortunately, the LP-22 has three LED bar graph meters indicating output levels, gain reduction and downward expansion, and an LED next to every switch, providing status at a glance.

Priced at $1,495, the LP-22 draws on more than a decade of Lafont innovation to create a versatile unit with excellent audio specs that should appeal to music and post users alike.

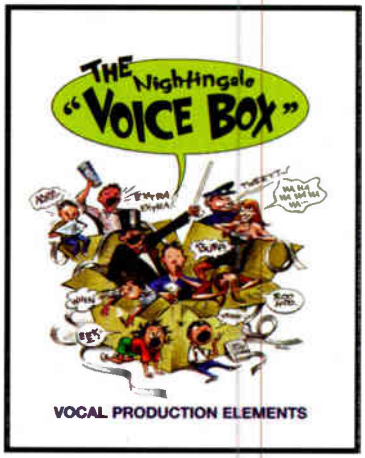
Lafont, distributed by Sascom; 905/469-8080; www.sascom.com.

—*George Petersen*

NIGHTINGALE VOICE BOX

Vocal Effects CDs

With lots of sound effects libraries on the market, the trend lately is specialized products, and the Nightingale Voice Box is an excellent new entry in the genre.



As its name implies, this set is an extensive collection of vocal elements—more than 1,500 in all, crammed onto two CDs featuring almost every imaginable (adult or child) vocal sound, ranging from grunt, groans, moans and screams to laughs, hiccups, burps, coughs, upchucks and, ahem...orgasms. Choose from a variety of included ambiences (bars, parties, dinners, restaurant, swimming pool, beach sounds and street festival), toss in a couple common phrases (from the many provided in English, French, Italian, Spanish, Cantonese, Russian and more) in the foreground—such as ordering a drink or shouting "happy birthday!"—and you can create just about any custom walla, anywhere, anytime. But the set doesn't stop there. Also provided are generic news reports, weather and other broadcast elements ("we'll be right back," again in several languages) and plenty of group reactions (boos, cheers, laughs and more).

The set is documented for finding what you need fast, and the audio quality is pristine throughout. At $245, The Nightingale Voice Box is an ideal addition to anyone's SFX arsenal.

Nightingale Music Productions; 416/221-2393; www.nightingalemusic.com.

—*George Petersen*

Who Needs Another Mic Preamp?

"...the finest sounding preamp I've ever used...as close to being the perfect preamplifier as possible. It is made well and it sounds unbelievable."

Russ Long, Nashville based producer/engineer, Pro Audio Review, June 2000

"The 1100 is the sweetest, cleanest, warmest, most flattering preamplifier I've ever used."

Jon Barry, Radio Personality, WMXB (FM), Richmond, VA

"The Aphex Model 1100 is a good example of something different... A work of art...The results were astonishing, providing an awesome sound that was natural, dynamic and absolutely free of noise."

George Petersen, Editor - Mix Magazine, April 2000

Model 1100 Discrete Class A
2 Channel Tube Mic Preamp
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AUDITIONS

DEMETER HDI-1 ▼

Tube Direct/Line Driver

Part of Demeter's H Series line of studio tube equipment, the HDI-1 is a 2-channel, rackmount unit serving both as a DI box and a line-level driver, ostensibly for "warming up" digital audio tracks. One 12AX7LPS tube is in the audio path for each channel; ICs drive the outputs.

Each channel has an unbalanced ¼-inch front-panel input that accepts either instrument or line-level sources. For an extra $35, Demeter will provide an extra pair of unbalanced inputs on the rear panel—an attractive option for those who wish to tie the HDI-1 into a patchbay for processing line-level signals.

Separate volume control knobs provide as much as 24 dB of boost for each channel. Independent "unity gain" switches disable corresponding volume controls but nevertheless provide 6 dB of boost for the XLR and TRS balanced outputs on the rear panel. Each channel also features a low-impedance, tube-buffered, unbalanced aux output for splitting an instrument's signal to route to an amplifier. Ground lift and phase inversion switches round out the channel controls.

My only functional complaint with the unit is that pressing its unity gain switch produces a loud pop. This is not an issue as long as you turn down your monitors beforehand.

The HDI-1's 27-megaohm input impedance prevents instrument pickup loading, making the unit an outstanding DI box for bass and electric guitars. Bass sounded lush, yet fully endowed with presence and definition. And my '62 Strat never sounded better, delivering gorgeously rounded, bell-like tones. The HDI-1 can also add nice coloration to line-level signals, although I would not say this is its greatest strength. Running entire mixes through the box, the stereo imaging became a little ghosty. But as a DI box, the HDI-1 offers the perfect marriage of warmth and clarity. At $899 for two channels, the HDI-1 is an attractive buy for the engineer looking to transform dry, flat DI tracks into lush, fat tones.

Demeter Amplification; 818/994-7658; www.demeteramps.com.

—Michael Cooper

JENSEN TRANSFORMERS ISO-MAX ▲

Audio/Video Ground Isolator Kit

Every day, studio and A/V installations become more complicated, as every job is a combination of analog and digital, audio and video, and unbalanced and balanced gear. Times when everything connects and plays back without hum, buzz and distortion seem to be the exception to the rule; and, locating the problem can be a problem in itself, especially when dealing with unbalanced I/Os.

Enter the Jensen Iso-Max Ground Isolator Kit, a $299 set that packs three of Jensen's most popular and widely used isolator boxes (ISO-MAX CI-2RR stereo audio isolator, ISO-MAX VB-1BB composite video isolator and ISO-MAX VR-1FF CATV isolator) in a portable carry case. The set also includes two BNC-to-RCA adapters, a pair of TA-R1 diagnostic test adapters and a troubleshooting guide.

The transformer-coupled ISO-MAX CI-2RR offers transparent ground isolation of any stereo signal and is virtually undetectable in the signal path. Designed for video/CATV lines, the ISO-MAX VB-1BB (line-level) and ISO-MAX VR-1FF (RF level) isolators eliminate 60Hz ground currents, with a bandwidth covering the full video/FM spectrum. By putting these simple, passive (no power required) problem-solvers in a kit, installers can easily troubleshoot systems, perhaps leaving an ISO-MAX unit in place at an install and then replacing the unit from stock. No sweat—and more importantly, no callbacks.

Jensen Transformers; 818/374-5857; www.jensen-transformers.com.

—George Petersen

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BY TOM KENNY

POST·SCRIPT

SOUND FOR FILM

IN PRAISE OF DIGITAL ARCHIVING

PART 1

by Larry Blake

In an earlier column, I neatly divided up the world of film sound professionals; either: A) They spring fully formed with a degree from the USC film school, or B) have a parent employed in da industry. A little glib and pat, perhaps, but there's a large kernel of truth in it.

My latest film sound polarization is that you're either a passive-aggressive whiner or a buttinsky squeaky wheel. The whining takes many forms. For example, production mixers complain about how their tracks are handled in post and use it as a justification for all sorts of odd practices. Or post sound people complain about the quality of production tracks, yet cannot be bothered to pick up the phone to talk with the production sound crew about the problems. (It would be even better yet, when possible, to discuss the recordings with the production mixer *before* production begins.) To paraphrase Mark Twain, everyone in film sound complains about everyone else's work, but nobody does anything about it.

If you have read any of my previous columns, you know what side of the fence I'm on; I'm a constant, nagging pain in the ass. If it's tough to care about other people's jobs while you're working on a film, it's even tougher when your film is in its *post*-post-production stage—lining up theaters, the various TV and home video versions, and foreign-language versions. A supervising sound editor's work should be over, right?

This month's column is the first of three parts regarding my stint as a squeaky wheel while wrapping up *Erin Brockovich* this past winter and spring. The first part will deal with my efforts in archiving all the elements, and the next two columns will cover the foreign-language and television versions, respectively.

In the old days, you delivered all the cut units, premixes, stems, print masters and M&E mixes on dozens of boxes of 35mm mag. You just handed it all over and went home.

Most of my colleagues still view the situation the same way. We have a set of delivery requirements from the studio or production company, and they look much the same as they did five years ago. The problem is that our working methods *have* changed radically, and what is best for the film isn't necessarily included in the deliverables. The reason for this is clear: Not only are many of us recording our mixes on hard drives, we have many more versions of a film to keep track of.

So we come back to the original lead of this column: You can choose simply to produce nothing more than required deliverables and walk away from it all, or you can do what will be right for your film in the long run, even though it may cost a little more and will certainly involve much more supervision.

I know what many of you are saying: *Erin Brockovich* was a big film by a major studio, and they had the money. Yes, that's true, but I have done more low- and no-budget films than I have big films, and although I don't give those films the A+ archival treatment that I gave *Erin*, I am always exceeding the letter of the delivery schedule to some degree. Besides, the actual cost of my archiving efforts, as described below, is a stinking small amount of money. Chump change, as you shall see.

First, let me deal with the perceived wisdom that the only way you can truly "archive" sound for a film is with analog tape or mag film whizzing past a head. After all, a "digital archive" is an oxymoron, right? By contrast, analog recording is not dependent upon software, and the technology is very simple, and there are thousands of those machines available worldwide. Yeah, yeah, I have heard all of these points, and others, many times, so please don't write me repeating them.

No, I am not saying that you should *not* print your mixes to analog media. On larger-budgeted films, I make sure that my 6- and 2-track theatrical print masters are printed to 35mm mag, along with two sets each of the 6- and 4-track music and effects mixes. (The idea is for one to stay in the U.S. and the other to go overseas so the foreign-languages mixes

—CONTINUED ON PAGE 160

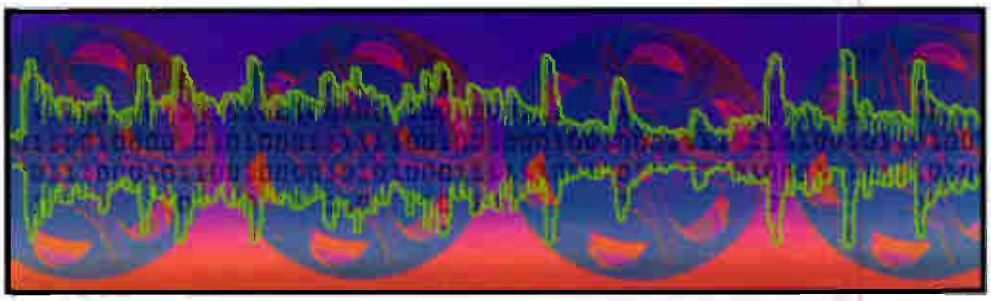

ILLUSTRATION: WENDY SHIRAKI

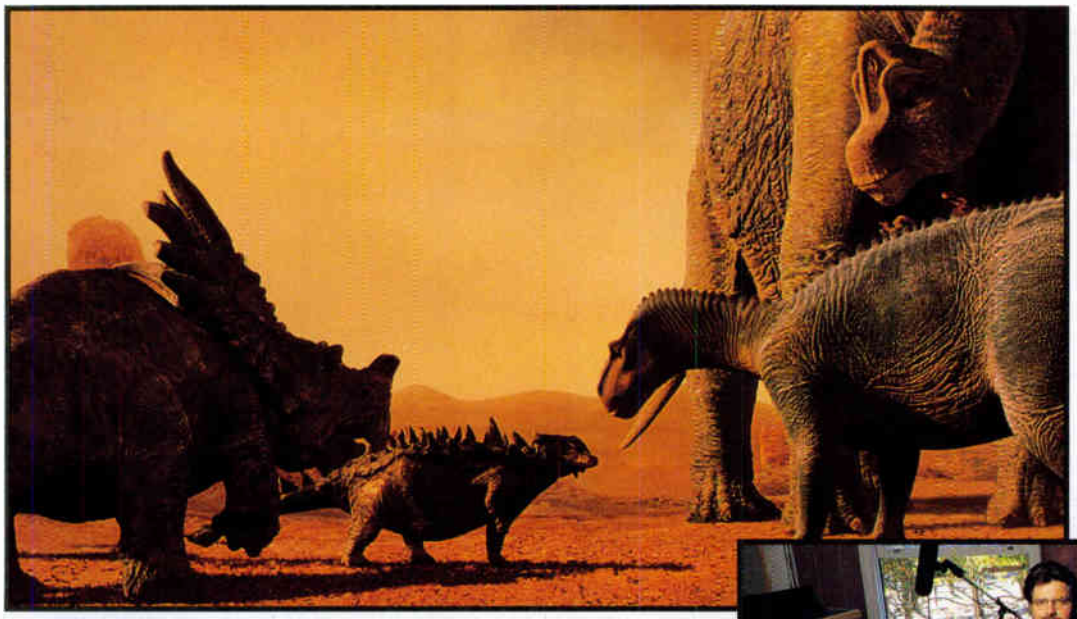

PHOTO: STEVE JENNINGS

Sound designer Chris Boyes in his Chris Pelonis-designed edit suite at Skywalker Sound.

DINOSAUR BY DISNEY

CHRIS BOYES TAPS ANIMAL KINGDOM FOR VOCAL SIGNATURES

by Tom Kenny

Chris Boyes knows dinosaurs. He knows how they walk, how they look without digital skin, how they bellow in fear or anger or joy. He knows the differences between a carnivore's salivating growl and a leaf-eater's quiet chew. And he should, because he has been directly or indirectly responsible for most of the sounds in the dinosaur craze throughout the 1990s, starting with *Jurassic Park*, where he recorded most of the original sounds that were later designed by Gary Rydstrom, followed by an assistant sound designer credit on *The Lost World*. For the past two years, with breaks during which he worked on *Titan AE* and a number of other design/mix projects, he worked up vocals for iguanodons, raptors, brachiasaurs and the like for Disney's hugely anticipated spring release, *Dinosaur*.

"It's deceiving, because you're not going to hear two years' worth of effects on the screen," Boyes laughs from his edit suite at Skywalker Sound. "It was more about the process, with issues that were addressed and resolved over that two-year period. Disney would give me shots in progress to work on, and once a week I'd fly down to Burbank to play them tracks. The first concept was that they wanted Aladar, our hero, to speak like a big dinosaur but in a rhythmic fashion that would give him a signature quality of a lemur."

As the movie opens, Aladar, still inside the egg, is separated from his parents during a raid by the T-Rex-like Carnotaur. A pterodactyl scoops up the egg to bring home for feeding, but loses it along the way and it ends up on Lemur Island, where Aladar is hatched and raised. During a comet storm, he must make it back to the mainland, eventually linking up with the dinosaur herd on a long trek to the sanctuary of the mating ground, dodging raptors and Carnotaur on the way.

After establishing the basic lemur vocalizations, Boyes tried to fit elements into Aladar but found they didn't really work. Instead, he let Aladar be a dinosaur, with the compromise being that he would be more melodic and vocal than his brethren. "The big challenge on *Dinosaur* was to create a series of languages," Boyes says, "evoking emotions that were everything from joyful and happy, to mournful and sad. With the human language, we can inject emotion very easily, but to try to do that by twisting sounds that originally came from animals was a challenge and perhaps the most difficult part of the film."

The early part of the film takes place on Lemur Island, where life is good and the comet hasn't yet rained destruction. Boyes tried using real lemur calls, but found them too mournful to be twisted into something joyful. "So I used a combination of penguins, a fox named Socks the Fox, and capuchin [monkeys]. The penguins had these wonderful whoops that worked well for movement, a jumpy kind of excited call. The capuchins were tremendously vocal and rattled off all sorts of little chirps. And Socks the Fox made these wonderful mournful yips and yaps that I was able to use both for happy and sad lemur. Then there's a wonderful scene, during mating season and just prior

PHOTO: ©DISNEY ENTERPRISES INC. ALL RIGHTS RESERVED.

to the comet falling, where they're coming into the camera and have these happy bellows. For some of those key calls, I ended up with human voices—one of my Foley editors."

Boyes, who edits in Pro Tools, relied on his Synclavier for design. "I'm making thousands of sounds," he says, "and you have to quickly figure out at what pitch the penguin fits with the capuchin. If I lead with the penguin, at what point do I come in with the fox? You're able to establish that arrangement on the Synclavier in a very natural, phonetic and musical way."

While Aladar's vocals and the lemur language were meant to signify community and a wide range of emotions, the vocals for the raptors and Carnotaur—though equally complex—were built primarily to inspire terror.

The basis of the raptors ended up being a 10-year-old Chihuahua with emphysema, which offered trills and growls and more than a bit of the menace. Boyes then layered in goose hisses and yellow-blackbird caws. "It worked well when the raptors are grouping together and surrounding their prey," he says. "There's a wonderful sequence when we first meet up with the raptors and you're lulled into thinking, 'These aren't bad creatures. We can make friends with them.' And they go from inquisitive and curious suddenly to these vicious creatures who want to rip our hero to shreds."

Boyes gives much of the credit for the dinosaur vocals to his recording team, including assistant sound designer Beau Borders and field recordists Scott Guitteau and Kathy Turco. Early on, Borders went to Florida for some field recording and came back with, among other things, a leopard sound that became the basis for the vicious, carnivorous Carnotaur.

PHOTO: ©DISNEY ENTERPRISES INC. ALL RIGHTS RESERVED.

"We called that 'pissed leopard,'" Boyes laughs, "because this guy was angry. Beau got some great recordings—real close, guttural, wet snarls and breaths and chuffs. In the first scene, Carnotaur is hidden in the forest, and he's breathing subtly and dripping, oozing liquid. It was very important to the director that he be wet and salacious. His salivary glands are in overload, and all he could think about was, 'Eat this thing.' So the pissed leopard with an elephant combination became this ethereal, regal, growling sound. Once he breaks out of the forest, I use the leopard with a pig sound—I think it's a large boar—and a macaw. The combination of those three gives a high shrieking element with a real feel for terror."

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The film overall offers a unique visual feel, with traditional and computer-designed animation integrated into real backgrounds (themselves digitized and manipulated). Sounds that Boyes recorded while on vacation in Hawaii provided the lushness for Lemur Island, while many of the wind techniques he honed working on *Titanic* proved useful once the dinosaurs embarked on the long trek through the desert.

"We end up in the desert for a long time," Boyes says, "and I wanted to keep it interesting. There's a sandstorm, which was fun to design and edit, with the winds rushing and Foley putting in some great particle sounds. There's night sequences where we play with processed crickets. And there's daytime, where the winds allow you to create this incredible spatial quality so that you feel like you're in this vast, wide open area. There was very little to echo off of, and there was very little life, other than the herd itself. A lot of the initial sound design I did that [Disney] didn't buy off on for specific characters, we were able to use for herd. We created a background of group walla, of dinosaur sounds, that read specific creatures and mass of creatures. In a way, the herd became the most interesting background of this film. Music is big at that point, so the herd pokes through."

Frank Eulner came on as supervising sound editor about a year into the project. Ethan Van der Ryn, fresh off *Saving Private Ryan*, cut the big opening and closing battle sequences, as well as the comet firestorm. Boyes, who usually mixes the films he designs, premixed the effects with Dean Zupancic on the Neve DFC at Skywalker. The stems were brought down to the main stage at Disney on Tascam MMR-8 drives, with original elements on Pro Tools drives. The re-recording team of Terry Porter on dialog, Zupancic on effects and Mel Metcalfe on music mixed on a Harrison console, with two Otari sidecars and Flying Faders automation. ■

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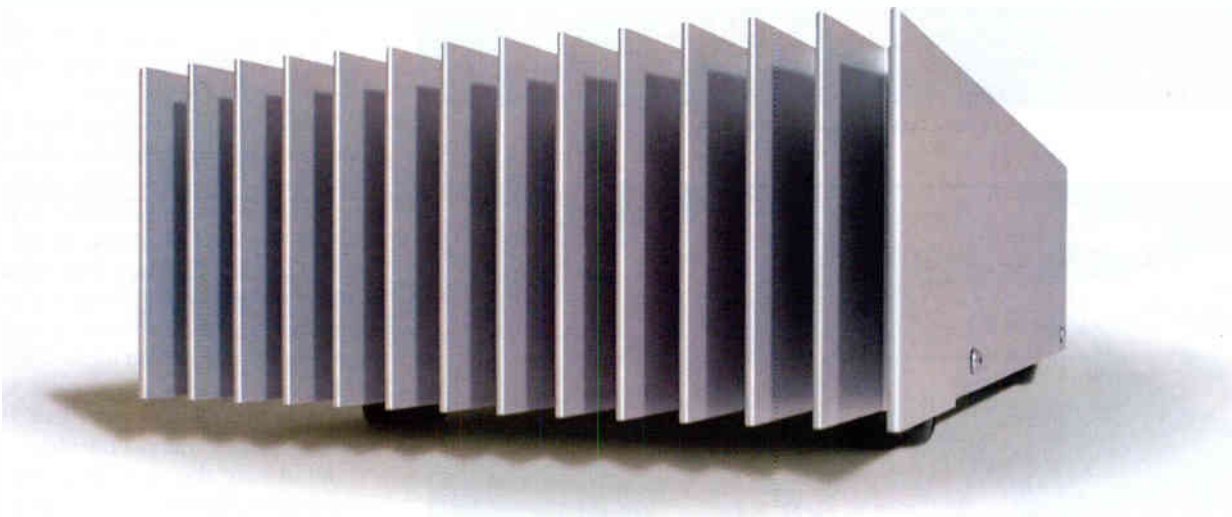

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migrate all of this material at some point in the near future because: A) No tape, digital or analog, can be expected to last more than a few decades; B) if the tape doesn't get me, then software versions will; C) you cannot "play" a DLT tape, a desirable feature in a backup medium; and D) my material is currently in Sound Designer II files, and the industry will presumably standardize on a file format in the near future, largely removing software issues from the equation. I'm assuming that whatever we migrate to will be a rugged, playable 20-Gig-plus optical medium, something that remains vaporware as of this writing. From that point on, the migrations will be fewer and farther between, not to mention a whole sight easier. The risk factor will also be greatly reduced as the whole industry starts to go in the same direction.

Note that I keep referring to media that store digital recordings as files on data tapes or disks, and not as linear recordings in the standard fashion. While I do make "linear, playable" copies of my mixes onto analog (print masters and M&Es as noted above) and digital (everything goes to DTRS in addition to DLT; see note to follow), I regard the "files" that the MMR-8 creates during the mix as the true masters. They can be copied from medium to medium quickly and easily; the opposite is true of all "playable" formats. The act of pressing "play" on one machine and "record" on another, with attention having to be paid to timecode, start marks, sample rate, etc., is so archaic to me as to appear barbaric.

The sharp-eyed reader might realize that I excluded the stems from my list of elements to be backed up to analog mediums. This is partly because of the pain-in-the-ass factor (my stems are usually 32 tracks wide and would take forever to back up to 2-inch or 35mm mag) and partly because I regard the stems as "god" and don't even want to consider the possibility of their being badly transferred by some yabaho in the future.

To make up for the absence of analog copies, starting with *Erin* I will be making an additional data backup of the stems to the 5-Gig magneto-optical format that has been adopted by a few major studios as their digital dubber archive medium. And although I might seem to be contradicting my earlier statement of using only one archive format, I'm not. I'm still committing myself to DLT; I added MO because it is a proven format that allows me to pay lip service both to my personal mantra of storing files and to the current wisdom of the film sound community.

It's somewhat illuminating to note the cost of backing up 32 tracks of 24-bit/48kHz stems, which for *Erin* took up about 36 Gigs of disk space. In DLT this cost $135 for three IIIXT tapes; the MO discs will cost $1,400 for 14, holding a reel's worth of 8-track information on each side. In the linear, playable side, we used eight DTRS tapes (two per 8-track set) at about $20 each. With 2-inch tape, it would be about $1,200, for four 5,000-foot reels.

The math is a little odd with mag, which goes up to six tracks in its standard form, so it would take six sets to logically divvy everything up, multiplied by *Erin*'s length of seven 2,000-foot reels. At a rate of $.08/foot, you're talking about $6,700 for something that would take a long time to transfer, a long time to leader and pop, and a lot of space to store. And for what?

If we had just bought the damn hard drives ourselves, I estimate it would have cost $3,200. And no, I'm not saying that this would have changed my approach to backing everything up.

Before I finish this subject, I want to make sure that I'm clear on my central point here: There is strength in numbers. Multiple data backups of your master—in your preferred format—is your first line of defense, but it must be supplemented by at least one other approach.

If you roll the dice on only one medium, be it DLT, MO, mag or 2-inch, you're sorely misguided, in my view. And if that solitary medium is DTRS, you are completely out of your mind and need immediate medical supervision. I don't care what your post-production supervisor and his or her delivery schedule is willing to accept; that format is simply not the stuff for master mix archives. I'm not saying that you shouldn't use DTRS, just that if you do, you would be advised to also copy it to a verified data format as soon as possible.

The Analog Brigade can send their hate mail to P.O. Box 24609, New Orleans, LA 70184, or e-mail swelltone@aol.com. ■

Larry Blake is a sound editor/rerecording mixer who lives in New Orleans for reasons too numerous to mention, although one of them would be that when he has to leave town in a hurry, he can drop off his precious masters at his momma's house, which is kept to a constant 70 degrees Fahrenheit.

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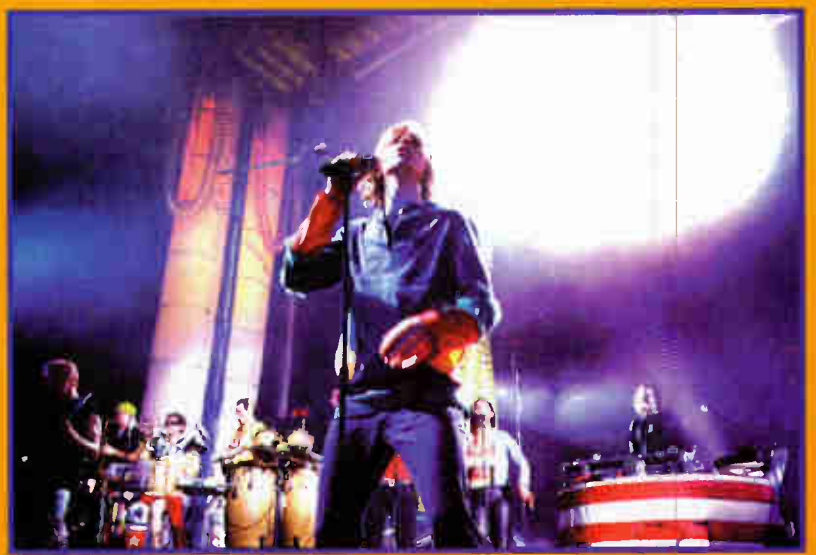
Out promoting *Midnite Vultures*, Beck is touring with a 10-piece band that includes backing vocalists/percussionists, horns and a DJ. After wrapping up European and U.S. legs, the tour headed to Japan in May and will return to Europe this summer. *Mix* caught Beck's postmodern soul revue—a three-semi, four-bus production that features Beck in a "rhinestone special" Nudie suit and a bed onstage—at the Bill Graham Civic Auditorium, in San Francisco, on May 2.

All the in-ear monitors are fed via Shure PSM700 and PSM600 wireless systems; musicians listen through E-5 ear monitors with standard foam pieces. For directional broadcast to Beck and the downstage musicians, monitor engineer Manu Goodwin uses a PA705 Unidirectional Antenna "paddle." The less mobile musicians' receivers are fed via omnidirectional antennae placed near drum and horn risers by Rat Sound monitor tech R.J. Desanto.

Goodwin manages 11 band mixes, a spare and a cue system. "I have 32 frequencies to choose from, and I have a scanner, so every day before I power up, I scan through the frequencies and make sure there are no TV or radio stations," he explains. All in-ear mixes pass through Aphex Dominator II peak limiters. "I have to be careful," Goodwin says. "Working in-ears it can get sensitive—stuff tends to get loud really quick. You gotta put a clamp on that."



Beck endorses Shure mics, and the act is using Beta 87Cs for vocal mics and KSM32s on horns and on congas. Some 98s and 91s are on the drums, 98s are on bongos, a 52 is on the bass rig, and the offstage guitar cabinets are miked with 57s.

Beck

PHOTOS BY STEVE JENNINGS • TEXT BY CHRIS MICHIE

FOH engineer Terry Pearson, who has been with Beck through the Odelay and Mutations tours, first hooked up with the artist while mixing FOH for Sonic Youth. Pearson is mixing on a Midas Heritage 3000, which, along with the monitor and snake systems, is leased from Rat Sound (Sun Valley, Calif.) and will go to Europe for the festival season. "Trying to do a line check in 20 minutes between acts is pretty daunting," says Pearson. "This way, I have a good sense of the gain structure. It'll definitely make things easier for me to have things dialed in initially." The 48-slot 3000 is loaded with 41 mono inputs and six stereo modules, which Pearson uses for effects returns.

Beck's distinctive vocal sound—essentially pronounced distortion at high SPLs—is created in Pearson's processing rack, which includes a Klark Teknik DN410 dual parametric EQ, an ART Dual MP tube preamp, a BSS DPR 901 dynamic equalizer and an Aphex 661 Tubessence Expressor tube compressor.

The Crest-powered P.A. from Rat Sound is based around the proprietary four-way "Rat box," which contains 12-inch, 15-inch, 2-inch and 1-inch drivers. Rat Sound system tech John Monson flew 12 a side at the Bill Graham arena, with eight more on the ground and 16 subs.

Beck's entire band relies on in-ear monitors, and monitor engineer Goodwin is using all 24 aux sends on his Midas Heritage 3000. The five downstage musicians get stereo mixes; the rest of the band is mixed in mono. Goodwin is using four aux buses for effects and creates a sidefill mix for the guitarist and bassist, whose amps and cabinets are offstage.

"This is the first Midas console I've worked on," says Goodwin. "It's got features on it that most monitor consoles don't have—24 mixes and 10 VCAs, which I really like. I use the VCAs on Beck's stereo in-ear mix—everyone else is pre-fader, Beck is past-fader. I have a lot of compression on everything just because there's a lot of wild sounds out there." Goodwin relies mainly on channel EQ for "tone" and uses no external EQs except for the sidefills. "I try to keep things as simple as possible," he notes.

Goodwin's client list ranges from Huey Lewis and the News (eight years), Kenny Loggins and Keith Sweat to Soul Coughing and Luscious Jackson. "This is the first band I've worked with that's been all in-ears," he says. "It does make it easier for me—there's no feedback issues, and you can work on tone a lot longer. As a result, we've gone to a lot more higher-priced microphones. The new Beta 87C is really nice. The rejection is great, and it has a much better pattern, much smoother." Goodwin is using KSM 32 condensers for audience mics. "Those are nice, but in a live room like this, I won't use much of them [in the in-ear mix] at all."

PATTI SMITH

STILL DANCING BAREFOOT

As the baby boomer generation ages, the ranks of rock 'n' roll continue to swell with rock elder statesmen, not yet ready to fade away. The emphasis in elder statesmen, however, remains on the word "men." Few women seem to inspire the same devoted following as, say, a Beatle or Bob Dylan...except for Patti Smith.

At 53, the mother of all punk put out one of her most critically acclaimed CDs in years, *Gung Ho*, her eighth album and the recording that fulfills the contract she signed with Arista 25 years ago. Only one of those albums, *Easter*, produced a Top 40 hit: "Because the Night," co-written by Smith and Bruce Springsteen, which crested at 13 in 1978. But her influence extends beyond the singles sold and into the recordings of R.E.M., Jim Carroll, Exene Cervenka, the Pretenders and other women rock 'n' rollers who look as cool as a Stone and retain their own voice.

But although Smith's inspiration has been felt, her appearances have been few and far between since 1977, when she broke her neck after twirling off a stage in Florida during "Ain't It Strange." After "Because the Night," she married Fred "Sonic" Smith of the MC5 in 1980, and apart from a few mainly spoken-word performances, she didn't perform with a band until 1995, after her husband's death.

Since then, Smith's shows have acquired a legendary mystique, and this album tour probably marks one of her longest stretch of appearances of late. In March, she kicked off the release of the new record with a South by Southwest concert, appearances on *Late Show With David Letterman* and *The Tonight Show* and a taped performance of "Because the Night," with Sarah McLachlan accompanying her on keyboards, which was scheduled to be televised as part of the *Arista Records 25th Anniversary Special*. In April, the poet-turned-rock 'n' roller did a two-week West Coast club tour with two original Patti Smith Group members, guitarist Lenny Kaye and drummer Jay Dee Daugherty, as well as guitarist and significant other Oliver Ray and bassist Tony Shanahan.

PHOTOS: STEVE JENNINGS

FOH engineer Martin le Maire

Smith's challenge is now one that many working moms face; she's torn between work and family, speculates freelance FOH engineer Martin le Maire of Rehoboth Beach, Del. "[Smith] hasn't been working so consistently that we have a real rhythm down," he explains. "She goes out, comes back home, and goes out. She's got two kids that she has to give attention to, so she's got a real life at home. This summer, though, once her daughter is out of school, I'll imagine we'll be touring a lot more."

It makes sense that Smith has gathered a crew around her that she considers a second family. "She's really great to work with and very, very forgiving," le Maire says. "It's not like, 'Oh, you gotta do this or you're fired.' It's not like the band and the crew—it's very much like a family sort of thing. I think she likes having people that she knows well and likes."

A friend of Shanahan since their days in Philly/Jersey bands, le Maire started doing occasional shows with Smith three years ago, and when her permanent engineer Pablo Wheeler left to go work with Bob Dylan, he stayed on, beginning with a European tour last summer. "Patti is the first act that I've worked with of that major status, rock icon status. It's been really exciting," drawls the laid-back engineer, hanging out before the second of three Fillmore shows, in the venue's poster-lined lounge. "People think she's this rough, spit-on-your-shoe kind of person. But she's really very sweet."

This leg of the tour isn't carrying a P.A. or console because of the size of the venues, which include Wilshire Theatre in L.A. and the Commodore at Vancouver. So, in keeping with the revolutionary

BY KIMBERLY CHUN

—CONTINUED ON PAGE 168

TINA TURNER LISTENS TO THE MIX

VETERAN TOURING STAR APPRECIATES GOOD SOUND

While in Las Vegas for the recent NSCA Expo 2000, *Mix* watched Tina Turner tear up the stage at the 17,000-seat MGM Grand Garden Arena. A knockout combination of dazzling star power, eye-catching production and immaculate sound, the Tina Turner show sets a standard for arena-style entertainment that lamentably few artists can match.

With Turner's musicians effectively isolated within the metal-lined cells of the futuristic set, monitor engineer Geno Salerno has his work cut out for him. After a complicated video monitoring system proved unusable, Salerno opted to position his ATI Paragon II monitor console under the front lip of the stage, the only place from which he can easily maintain eye contact with star and musicians. Besides managing multiple in-ear mixes for the musicians, Salerno keeps Turner's vocals "nailed" in eight Clair Bros. 12AM wedges while his indefatigable star stalks and shimmies across the multilevel set.

Turner also has sidefill monitors—"Clair copies of Martin bins, double 15s," as FOH engineer Dave Natale describes them—which Salerno feeds with vocals and a subset of Natale's house mix. "One day [Turner], said 'I want to hear what you're mixing out front,'" Natale explains. "I said, 'Well, come on out and stand out here [at FOH] when the band gets here.' She said, 'No, you idiot—onstage. I want to hear what you're mixing.' So I made a mix up on a stereo send—I don't have any effects, so there's 10 aux sends free. I put a mix up at unity gain, post-fader, so it's following, level-wise, what's going to the house. It's all the instruments, no vocal mics and no overheads—basically just an instrument mix. But it follows all the solo moves that I do, which are gargantuan! Her vocals are really loud when she's singing and the guitar goes up to exactly where her vocal was—something's got to keep the punters interested. So she gets exactly the same mix as the house."

Geno Salerno (left) and Dave Natale at the FOH board

PHOTOS: STEVE JENNINGS

Turner obviously has excellent taste—Natale is one of those all-too-rare mixers whose work consistently complements the dynamics and focus of the music. In the sold-out Garden Arena, an undistinguished but acoustically inoffensive multipurpose venue, the flown array of Clair Bros. S4s produced a smoothly dynamic sound at viscerally exciting levels. Like Turner's charismatic performance, Natale's mix was both modern and retro, tender and raucous, occasionally bombastic and ultimately exhausting.

Does Natale have a secret? If so, it must be simplicity. Using only a stock Yamaha PM4000, a single Manley Electro-Optical Limiter on Turner's vocal mic and one reverb unit, Natale creates a mix that is clean, loud, articulate and impressive. "We mix," he says of Salerno and himself. "I push the faders up and down thousands of time during the show."

Having logged five world tours with Turner since 1985, not to mention his stints with Bad Company, Yes, Prince, Boz Scaggs, Stevie Nicks and others, Natale finds life on the tour bus steadily less alluring and hints that his road-dog days may be drawing to a close. We salute a top-drawer FOH mixer and wish there were more of them. —*Chris Michie*

—FROM PAGE 166, PATTI SMITH

spirit, le Maire says he gets Smith's message across "by whatever means are necessary," with help from Smith's longtime guitar tech Yeuk Wong, tech Andrew Burns and tour manager and tech Barre Duryea. (There's no monitor engineer.) It's "equipment du jour," although if he had his druthers, le Maire would prefer EAW systems and Yamaha PM4000s, because he likes to put the whole band on one VCA and her vocal on another and work the two against each other during the rockin' songs. At the Fillmore, it's a Crest desk with a Meyer P.A.

Every show demands a very active mix, le Maire says. Smith keeps le Maire on his toes, with both hands on the console, as she spontaneously adds songs to her set, mixes the tunes up, or launches into a monologue about Palm Sunday, as she did at that night's concert. "She's just really dynamic. She'll be singing and then just pull this clarinet out and wail on it," he explains. "So you have to be prepared. It's not a static set to mix and forget about. There's a lot of manual attention needed. I don't sit there with a one-finger kind of thing."

The show at the Fillmore that night ranged from the infamous "Ain't It Strange" and "Gloria" to *Gung Ho*'s "One Voice" and "Stranger Messengers," sweeping from a whisper to a scream or "full-out band chaos," as le Maire puts it, in one song. "She'll be all over the stage, kneeling down, sometimes laying on the floor. She'll get out in the audience with the microphones. You really got to pay attention with her because it'll be a surprise sometimes," he recalls. "The dynamics are pretty wide, pretty up and down, so there's lots of compression used on things just to keep things in check."

Three Distressors, manufactured by his old friend Dave Durr at Empirical Labs, keep the vocal, bass guitar and drums in line. "They just give you a lot of really good control," le Maire says. "You don't really hear any ill effects from it. They're just very fast, and they work very well. I know they're meant mostly for the studio, but I think they're out on the road fair amounts." He also patches a dbx 1066 across the stereo toms subgroup.

At the Fillmore show, the engineer used Shure mics all around, with Beta 58As on Smith's vocals. "I know there are other, more high-fidelity microphones," he says. "But for her, especially, when she's onstage, sometimes she knocks the mic over, and it hits the floor, because she just gets excited up there, and it gets a little rambunctious. The Beta 58As seem to take whatever happens up there."

Le Maire also tries to match his mix with Smith's vibe. "The guitars really need to be up there and in your face with her vocal sitting in there," he says. "She's not necessarily on the microphone all the time, so I really have to keep that in mind because she'll move off it a lot. She just really gets into her songs, and she's not paying attention to certain things like that too much. It's more the effect of the show, just her energy and the message she has."

The new album does sound more polished than previous recordings, such as *Radio Ethiopia*, so le Maire says he "spec'd out a Harmonizer for this leg, because a lot of the songs and mainly the single ['Glitter in Their Eyes'] have a lot of triple-tracked vocals or something. So I'm trying to simulate that to get a thicker vocal sound."

Most of the time, her vocals just need a little reverb and occasionally a little delay, "but not all the time, and it's not really exaggerated," le Maire says. "It's not a real polished, produced kind

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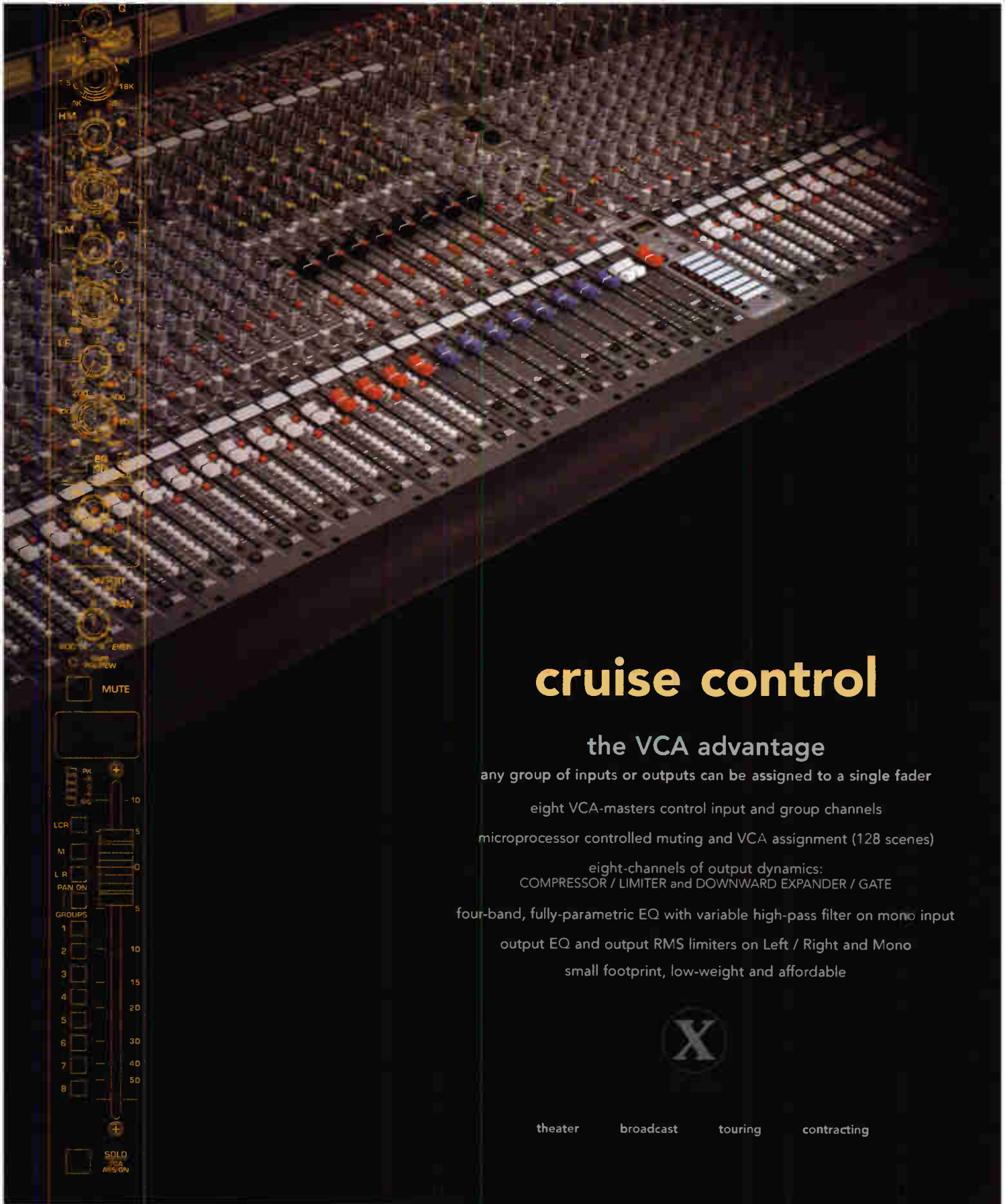
of sound. We try to keep it kind of raw so there's a little bit of room sound on the kit. Depends on the song, some songs are much more bigger and open, and there's space to let the reverb hang a little bit. I'd say 'Southern Cross' is one that has a much larger sound, has much more open space for bigger reverbs and stuff like that. There's other songs that are just very small, like 'Grateful.' It's basically her on her own acoustic guitar, and it's a very intimate little song that she dedicated to Jerry Garcia. It's almost like a little country type of tune."

Le Maire uses whatever mics the club has, such as Sennheiser 409s or Shure SM57s, on the guitars, because "basically it's a straight-ahead kind of rock 'n' roll show." To keep the stand clutter down, Shure SM98s are clipped on the four toms and snare, and the engineer carries his own AKG 451s for the hi-hat and ride, Audio-Technica 4041s for the overheads, and an Electro-Voice 868 for the kick. "I can work with anything, pretty much, but I'm particular about having decent mics for cymbals," he adds. "If a club has a Beyer 88, that's a preference, but ever since I blew a diaphragm on the one I have, I don't bring it out anymore. They're not meant for kick drum really, but everyone loves the way they sound on a bass drum. They're more a vocal mic. I found that out by blasting one of mine and having it fixed, and it cost more than the microphone."

Le Maire believes the tour might add a monitor engineer when it was scheduled to continue in May and cover the rest of the U.S. But for now, Smith is just experimenting with Shure in-ears during rehearsal. "She's interested, but it can really throw her off because with both of them she's totally isolated and you really need a monitor engineer to give her everything she needs. We're thinking of trying just one with her, with just her main and vocal in it," he says. "I think she's happy right now just dealing with wedges, what she's used to. That's all she's ever had since the '70s."

Still, le Maire has his work cut out for him, as he seamlessly blends songs from the '70s and '90s together while Smith plays shaman, summoning the spirit of rock 'n' roll ecstasy for audiences every night. "If people leave saying, 'Wow, that was a great show. It sounded really good,' I feel like I'm doing my job," says le Maire, "because I'm super-picky. I'm never totally satisfied." ■

Kimberly Chun is a copy editor at Mix.



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Designed for fixed installs or touring, the compact, high-power Axia from MacPherson (www.macpherson-inc.com) is available as a tri-amp or 3-way bi-amp system, and can be used singly or coupled to form a full-range vertical line array. Built of Baltic birch, each cabinet houses one 15-inch LF, two 8-inch MF, and a 2-inch HF mounted on a 90°x55° slot CD horn flare. Axia's ExoSpine rigging system integrates the flying hardware directly into the cabinet, for fast setup/tear down, and an optional Fly Bar/Stacking Base creates flown or deck-stacked arrays. Axia are also available with hanging points for permanent installs.

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The FLEX2000 snake cable from Ramtech Industries Inc. (www.ramtech.net) is designed for pro audio applications. A FLEXALLOY™ compound added to the outer polyvinyl chloride jacket allows for an extremely flexible cable with a jacket that resists abrasions, tearing and guards against extreme temperature change. A "reverse lay" technique used in manufacturing guards against pair migration, a problem for snakes that are continually coiled and uncoiled.

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The 2-way Control 25AV speaker from JBL Professional (www.jblpro.com) offers an extended frequency response of 70-23k Hz (-10 dB) and is designed for applications requiring magnetic shielding or outdoor capability. The Control 25AV, which replaces the discontinued Control 1AW, includes a stainless steel grille, polypropylene woofer cone with weather-resistant dustcap, titanium-coated tweeter and an improved 70V/100V (selectable) transformer, all in a 9-lb., 9.3x7.4x6.3-inch (HxWxD) high-impact polystyrene cabinet.

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PEAVEY COBRANET BRIDGES ▼

Peavey Electronics (www.peavey.com) adds three new CobraNet audio network bridges to its CAB series: the CAB 16i, 16o and 16d. CAB audio bridges link audio to and from Ethernet networks and allow MediaMatrix® Mainframes/Miniframes to be integrated into larger, more flexible systems. The CAB 16i provides 16 line level inputs, and the 16o has 16 line outputs. Both feature 24-bit quantization and an RJ-45 network port compatible with

CAT5 and EIA-TIA 568 standards for 100 baseT. The CAB 16d has 16 AES and S/PDIF compatible digital I/Os (allowing digital audio to remain in its original format throughout a large network) and includes an RS-485 connector.

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STK 12-INPUT DESKTOP MIXER ◀

The new VX1202 desktop mixer from STK Professional Audio products (distributed by Redwood Music Corp., www.redwoodmusic.com) has four mono and four stereo inputs, for a total of 12. Inputs feature 3-band EQ (with sweepable mids), two aux sends, pan and a mute/B-Mix switch. Additional features include 48V phantom power, 60mm faders, CD/Tape I/Os and an internal power supply. Stereo outputs are balanced. Price is $559.95. An optional rackmount kit is $26.95.

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A LOOK AT SOME RECENT

by Blair Jackson

When *Mix* first decided to investigate the making of a few new live CDs from different musical genres, we didn't know how each had been recorded, so in a sense this is a random sampling of discs that sounded interesting to us. It was only after we began interviewing the engineers that we discovered a trend: There are *a lot* of musicians out there who are making live CDs using modular digital multitracks (MDMs). From what we can glean, most of the traditional high-end mobile recording companies are still thriving in the face of competition from engineers using less expensive bare-bones setups rather than remote trucks. (Of course, many trucks also do MDM recording, too.) In fact, it seems as though the MDM revolution has simply increased the number of acts who consider making a live recording, and it appears that conventional studios have been the unexpected beneficiaries of this phenomenon—all those ADAT and DA-88 tapes have to be mixed somewhere! If the following article seems inordinately weighted toward projects done on MDMs, it's really just luck of the draw.

TAJ MAHAL

BLUES WITH A SMILE

Taj Mahal is more than just a blues/R&B singer. He's a national treasure, a living storehouse of musical Americana. He was "roots" before it became fashionable; indeed, over the course of nearly 40 years, Taj has done much to expose the deep folk and blues roots that are such a vital part of our national soul. He's had years when he sold a lot of records and his visibility was high, and years when he had to hit the road with just his guitars to make ends meet. Fundamentally, his music has changed little over the years—he's still singin' "the natch'l blues" (though certainly he has broadened his palette, as he experimented with African and Caribbean colors). The past few years have been particularly good ones for Taj, in part because he's fronting his strongest group in ages, the Phantom Blues Band. There have been a number of highly successful tours, a Grammy, accolades in the press and now...the live album, *Shoutin' in Key*, on Hannibal Records. The CD finds Taj in great spirits (no surprise there) leading his crack band through a soulful collection of blues and R&B numbers that range from ageless folk tunes to modern originals. Yes, it's the blues, but you can almost always hear the smile through Taj's smoky voice, and his upbeat band—seven pieces including the incendiary two-man Texicali Horns—sounds like they're having the time of their lives, too.

Shoutin' in Key was recorded over three nights at The Mint, a venerable L.A. club that has been showcasing local and national blues and roots acts forever, it seems. "Tony Braunagel, who plays drums in Taj's band, had wanted to make a live album for a while, and I was thrilled to get the opportunity to work with Taj," says Terry Becker, who recorded the CD, which was produced by Braunagel. Becker was a fixture in L.A. for many years, working with acts such as Jackson Browne, Manhattan Transfer, Patti LaBelle, Strunz & Farah and many others, before moving to Massachusetts to teach at Berklee College. "The Mint is such a great place to hear music," she continues. "The only problem with it is that it has a really small stage; I mean, it's *tiny*, and Taj's band is pretty big,

LIVE RECORDING PROJECTS

so they were just *stuffed* up there. It might have made it a little tougher to record, because of all the bleed, but there was an energy up there that was amazing.

"One thing that made my job a little easier is that they have a control room in the club, right off the side of the stage, so it was almost like doing a real remote with a truck, rather than having me inside the main part of the club. To be honest, I wasn't crazy about the console they have in there, so I borrowed and rented a lot of really good mic pre's—Avalons and Neve 1073s—and bypassed the board, because we knew we were going to be doing this on 24 tracks of ADAT. I much prefer doing everything analog, but because of the money involved to get a really good analog setup into The Mint it would've been a bit much. But the preamps in combination with the ADAT was fine. The Mint had a couple of Neve 1081 preamps. I had those on the bass, 1073s on all the drums and the horns, and I had the Avalons on Taj, his guitars, all the keyboards and the other guitar."


Taj Mahal

The size of the stage was only a problem for Becker when it came to miking the drums. "There was so little room around the drums I used a technique called 'earrings,' where you point the mics about a foot off the drummer's shoulders. Tony was literally back up against the wall; there was maybe six inches from the back of his stool to the wall. For those earrings I had a pair of mics—SM81s—facing toward the toms and snare. I also had Schoeps overheads, but it was impossible to position them exactly where I wanted to because the stage was so small. But those sets of mics picked up a completely different ambience. I had clip mics for the toms, an AKG D112 on the kick, the snare was a 57, and the hat was an SM81. I ended up using ten tracks for drums, and the only things I combined were the toms. I had a track for each of the horns—a Sennheiser 421 on the sax and an SM7 on the trumpet and trombonium; a track for Taj's guitar, which was done with a combination of a DeMaria tube direct and an SM57 on his amp. On the piano I had Countryman DIs. I miked the organ's Leslie with a 421 on bottom, and I can't remember what on top. The club already had its own mounted audience mics, so I had very little control over that, but it was fine.

"I ran everything to 24 and also did a stereo DAT recording, which was helpful for when Tony and Taj and the band went back and listened to the performances. We did three nights, so we had two or three takes of most songs, though there were a couple of changes each night. I have my own monitoring system that I bring which makes all the world of difference to me: I use Mastering Lab 10s and a very large Perreaux 7000B amp."

When Becker left the project to move to Boston, engineer Joe McGrath was brought in to preside over a few minor fixes (at Porter's Den and Ultratone Studio) and then the mix, which he did at House of Blues on their API console.

Becker is still glowing from the experience of working with Taj Mahal. "He is such an incredibly charismatic person onstage," she says. "His energy comes across through everything he does and says. He's just so wonderful; I had a blast doing this!"

FAMILY VALUES

KORN, LIMP BIZKIT AND THE HEWITTS

You gotta love a CD that features a sleeve photo of a tattooed baby's arm giving us The Finger, not to mention shots of babies smoking, drinking, holding a gun and looking at pornography. (In fairness, we should note that

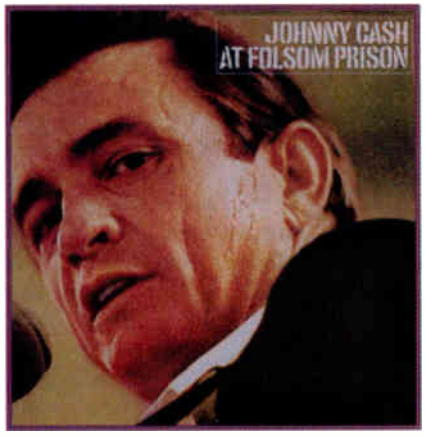
—CONTINUED ON PAGE 180

JOHNNY CASH'S "FOLSOM PRISON BLUES"

by Barbara Schultz

Nineteen sixty-eight was a time of rebellion and rebirth for the United States, and it was one of several such periods in the life and career of Johnny Cash. That year, Cash married his soul mate, June Carter, who had helped him leave behind the drug abuse that had endangered his career in the middle part of that decade. It was also the year Cash recorded his most popular album, *Johnny Cash at Folsom Prison*. The first few seconds of this live album still stand among the most electrifying in the history of concert recording. Cash begins with his trademark greeting, "Hello, I'm Johnny Cash," the inmates cheer, and Cash begins playing, and then singing "Folsom Prison Blues."

It's the way everything came together that makes this version of "Folsom Prison Blues" so thrilling, and made it the smash hit it was in '68. Cash's strong songwriting was matched by the brilliant playing and timing of his longtime cohorts, the Tennessee Three (guitarist Luther Perkins, bassist Marshall Grant and drummer W.S. Holland), and the sizzling energy of the inmate audience, as they fittingly cheered, howled or mourned at every line. The live recording, which had been Cash's idea, breathed new life into this 12-year-old song.



"Folsom Prison Blues" was actually one of Cash's first compositions. While in the Air Force in the early '50s, during the Korean War, he bought his first guitar and began writing songs. In 1955, after his stint in the military, he landed his first recording contract at Sam Phillips' Sun Records. Cash had hoped to be signed as a gospel artist, but Phillips—one of the true architects of rock 'n' roll and rockabilly—was looking for something more commercial. So, Cash suggested some of his own songs; his first single for Sun was "Cry Cry Cry"/"Hey Porter," which entered the country charts at Number 14.

The studio recording of "Folsom Prison Blues" was the follow-up single, and it first reached the country Top Five in 1956—just one of the many hits Cash scored with Sun. He became the first of Phillips' stable to record a full-length album in 1957: *Johnny Cash With His Hot and Blue Guitar* included two Number One songs, "Ballad of a Teenage Queen" and "Guess Things Happen That Way." However, Cash still yearned to record a gospel album, and Phillips still didn't want one from him, so Cash left Sun and began his long relationship with Columbia Records.

Meanwhile, the prison circuit was already becoming a regular part of Cash's touring schedule. "The prison albums were natural ideas," Cash wrote in his 1997 autobiography, *Cash*. "By 1968, I'd been doing prison concerts for more than a decade, ever since 'Folsom Prison Blues' got the attention of the inmates at the Huntsville, Texas, prison in 1957. They'd been putting on a rodeo every year, and that year the prison officials decided to let them have an entertainer, too; they asked for me.

"As soon as we kicked off, though," Cash continues, "a huge thunderstorm let loose—I mean a big one, a real toad strangler—and that cramped our style considerably. Luther's amplifier shorted out, and Marshall's bass came apart in the rain. I kept going, though, with just my guitar, and the prisoners loved that. Word got around on the prison grapevine that I was okay, and the next thing I knew I got a letter from San Quentin, asking me to perform at their annual New Year's show on January 1, 1958. I went ahead and did that and did it again for several years in a row, taking June with me the last couple of years. I didn't know until years later when he told me so, that Merle Haggard had been in the front row for three of those concerts."


PHOTO: ©JIM MARSHALL

In Folsom Prison, Johnny Cash shakes the hand of inmate Glen Sherley, who wrote "Greystone Chapel" on the album. Also onstage: bassist Marshall Grant (center) and guitarist Luther Perkins.

Cash says that he had a strong sense early on that if he ever made a live album, prison would be the ideal location. "Those shows were always really hot," he writes. "The inmates were excited and enthusiastic, and that got me going...I didn't get anywhere when I approached [Columbia producer/A&R representative] Don Law with the idea, though; he just didn't like it. Then when Bob Johnston [producer of *Johnny Cash at Folsom Prison* and other Cash recordings] took over my production, I mentioned it to him, and he loved it...I called a preacher friend of mine back in California, the Reverend Floyd Gressett, who went into Folsom to preach once a month and knew the officials there, and we set it up."

There weren't a lot of records kept regarding the technical aspects of this recording, but we can see in Jim Marshall's excellent photos, such as the one above, that mostly Shure SM56 microphones were used. (The now-discontin-

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ued SM56 was essentially an SM57 on a swivel-mount.) We can also see the Shure SH55 and University vocal horn that were patched together for the P.A. Marshall's memories of the day at Folsom also corroborate Cash's beliefs about the atmosphere in the prison hall: "I think if John would have said, 'Follow me out of here—we're goin',' they would have followed him; blacks and white alike. The electricity at Folsom was amazing. You can hear it on the record."

Marshall also says that, unlike the later San Quentin recordings, the Folsom show was "much more spontaneous. It was like 'Let's go do a concert, and we'll happen to record it.'"

Bob Irwin, founder of another great reissue label, Sundazed Music, has produced more than 350 releases for Sony Music Legacy. He recently produced the remastered version of *Johnny Cash at Folsom Prison*, so he has worked with the masters Columbia's engineers vaulted more than three decades ago. "The show was originally recorded to half-inch, 4-track," he says. "The engineers would run both an A and B machine, overlapping, with minimal processing—no EQ going to tape. They would, however, put each channel through what was most likely a bank of LA-2As, which is why Johnny's vocal has that crunchy, slightly distorted quality. I certainly don't mean that to be disparaging, though; that sound has become an intregal part of this recording. It was also leakage central, which is also fine, because that too has always played an important part

Cool Spins

The Mix Staff Members Pick Their Current Favorites

Vigilantes of Love: *Audible Sigh* (Compass) "Failure, she's your new found friend/You let her sleep on the floor/And when you rise to check out, she follows to the door." So begins the Vigilantes of Love's new CD, a viscerally exciting journey through the psychic landscape inside the mind of singer/songwriter/guitarist Bill Mallonee—miles of open highway under ominous clouds, and stops along the way in the lands

of self-doubt, heartbreak, despair, disillusionment and other dark way stations. Then why is this album so exhilarating? Because Mallonee and his bandmates (drummer Kevin Hauer and bassist Jacob Bradley) and various talented musical friends (including guitarists Kenny Huston and Buddy Miller and singers Julie Miller and Emmylou Harris) play Mallonee's stirring, sometimes anthemic, countrified rock tunes with such conviction, it's impossible not to get caught up in his pathos. Musically, Mallonee is mining territory that's been blazed by others—Bruce Springsteen, John Mellencamp, Bruce Cockburn and various *y'alternative* groups spring to mind—but Mallonee's lyric vision is both original and compelling, and his rough-hewn arrangements perfectly match the sentiments of his songs. There's melody galore and soaring harmonies, but also true *grit* that obviously comes from lessons learned the hard way. We're only halfway through 2000, but so far this is my favorite CD of the year.

Producers: Buddy Miller, and Bill Mallonee. Engineers: Chuck Linder, and Miller. Mix engineers: J.R. McNeely and Miller. Tracking studios: Dogtown and Midtown Tone and Volume (both in Nashville). Mixing studios: Dogtown and Sound Kitchen (Nashville). —*Blair Jackson*

Belle & Sebastian: *Fold Your Hands Child, You Walk Like a Peasant* (Matador)

Belle & Sebastian may seem a tad too academic for some ears. At times, singer/songwriter Stuart Murdoch's combo comes off

—CONTINUED ON PAGE 193

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in the imaging and texture of the record."

Irwin says Columbia didn't keep a record of what the date was recorded to, but it was "probably nothing fancy back then. Most likely it was a small truck sent out by Columbia Records. As a rule, Columbia recorded many remotes—more than I've ever seen at any other major label. There are enough wonderful vintage live recordings available that it has afforded Sony/Legacy the opportunity to create the whole "Live From the Vaults" series. From Clive Davis' time at the label, and actually for a few years before that, this company made it a rule to be doing remote recordings, which is now an absolutely wonderful resource to draw from."

After the gig, the A and B versions of the concert were taken back to the studio and compared, and the original multitrack for the album was created. "They would actually cut the preferred takes out of either the A or the B reel," Irwin says, "unless there was something that was captured on the B machine that was missed on the A machine. In this case, the entire B set of reels was untouched, and that's what we worked from, because the original show was there in the original sequence. The flow and pacing of the show were second to none."

Johnny Cash at Folsom Prison went Gold the year it was released, and "Folsom Prison Blues" re-entered the country charts—a dozen years after the Top Five success of the studio version—and went to Number One. The song was also a crossover hit for Cash, going to Number 32 on the pop charts and, for a time, earning Cash a mainstream following. "I've always thought it ironic that it was a prison concert," he observes in *Cash*, "with me and the convicts getting along just as fellow rebels, outsiders and miscreants should. That pumped up my marketability to the point where ABC thought I was respectable enough to have a weekly network TV show."

This was, of course, just one of the many peaks in Cash's long and productive career. Like many of the great country and rock 'n' roll artists he came up with, he's been lost and found a dizzying number of times by the American public. To his credit, however, what he remembers about *Johnny Cash at Folsom Prison* has nothing to do with chart success and everything to do with what he tried to bring into the lives of some forgotten men. In the liner notes to this year's remastered *Folsom Prison* CD, Cash writes:

"There are scenes as sharp in my memory as if it were last night. The look on Glen Sherley's face as I announced his song, the reaction from the cons when I introduced myself, and the faces. The pain and hopelessness of a soul beaten down, of failure, of failure to stay free of the system, of failure to be able to ignore today's pain.

"But there are swelling balloons of joy to burst in a couple of hours for sure when they have to go back to their cells. But, for now, let it blow! We are in the timeless now. There is no calendar inside the cafeteria today, January 13, 1968." ■

—FROM PAGE 175, IT'S ALIVE

these photos condemn the behavior pictured and are each captioned "No family with values should expose their children to this.") For the past two years, the Family Values Tour has provided its overwhelmingly young, male audience with hour after hour of aggressive, metalloid, sometimes politically charged rock and rap (with splashes of reggae and the stray ballad thrown in here and there). Each tour has produced a headbanging compilation/souvenir, and *The*

Family Values Tour 1999 disc just came out in May on the Flawless/Geffen label. The disc features performances by Limp Bizkit, Korn, Staind, Method Man & Redman, Filter, Crystal Method, Aaron Lewis & Fred Hurst and a group that are practically old-timers in this scene, Primus. Every fuzzed guitar, booming kick and slurred vocal is immaculately recorded; no doubt it sounds even better than it did in the packed arenas the tour visited last fall. This CD rocks *hard*.

Though most of the bands are made up of self-proclaimed misfits, miscreants and malcontents (is that the rubble of Woodstock '99 we see in the rearview mirror, boys?), you can't fault their choice of mobile recording trucks: Twelve of the 14 cuts on the CD were recorded by the veteran engineer David Hewitt and his son Ryan in the famous Remote Recording Services "Silver Studio"; the two Primus songs were done by Westwood One. The CD was mixed by Brendan O'Brien at Southern Tracks in Atlanta. Quite a pedigree.

"We only did two shows for the tour, one in Biloxi, Mississippi, and the other in Missouri," says Ryan Hewitt. "The Biloxi one was on Halloween, and it was pretty wild. They're probably some of the loudest acts we've ever worked with. I didn't have a sound meter, but I'd guess from my audience mics that it was pushing 120 dB. It was definitely the most powerful sound system I'd ever seen in my life. It's aggressive music, and they really involve the crowd. They encourage the kids to blow off steam, so the crowd noise is great!"

PHOTO: STEVE JENNINGS

Jonathan Davis of Korn

Spoken like a true engineer. Ryan. The Silver Studio, which is one of the busiest trucks in the business, is equipped with a Neve VRM 48x48 console, a pair of Studer consoles, KRK monitors, two Studer D827 48-track and three Sony PCM-800 digital recorders, and an impossibly large selection of outboard equipment for such a compact space. Ryan Hewitt talked about specifics of this recording gig:

"This was a situation where they had band carts—one band would be on and the next band would already be set up on another cart or stage that would be moved into position as soon as the other set was over—the set changes happened in about 15 to 20 minutes, which is pretty good. There were four bands each night, and they were all pretty straightforward except one night we had DMX, which was just a DAT, a couple of turntables and vocal mics. It was all direct except for the vocals [No DMX tracks are on the CD]. The other night we had Crystal Method, and they had their own mixer onstage with all their MIDI gear—MPC 3000s and various synths and loop devices, and they mixed themselves onstage with a little Mackie board, and then gave us a 2-mix. They were great; it sounded really good.

PHOTO: STEVE JENNINGS

Limp Bizkit's Fred Durst

"I believe on this tour we didn't have to substitute any mics [specially for the recording] because they had a very good selection already. The only thing we added were the audience mics: We had four Audio-Technica 4073 shotguns across the stage looking out at the crowd; they have very good side rejection, so we don't get too much of the P.A., though we have to roll off a lot of bottom end because they're sitting right next to the subwoofers. Then, out at the front-of-house position, we put up a pair of cardioids looking at the back of the hall and a pair of omnis to pick up the general vibe of the room—the crowd, the P.A., to make it feel live. So we put up eight mics and we put those onto an 8-track [the PCM-800, Sony's version of the DA-88], with the audience tracks separated, and then we put a mix of the audience on the Studer multitracks, which are beautiful-sounding machines.

"There were two separate splitters, and they [FOH] would hand us tails from the splits. We called it an 'A' stage and a 'B' stage, even though it wasn't a revolving stage the way it was at Woodstock. The 'A' set would come down 48 channels of our main snake and into the Neve console preamps, and then the 'B' snake or 'B' stage would come down another set of 48 channels of copper into another set of preamps that we had preset for the next band. Those were outboard preamps—Millennias and APIs—in a separate rack. For this particular gig, we had those in the truck with us so we could adjust them on the fly if anything was different than it was in soundcheck. The mic pre's that are outboard would come back to the line inputs on the console, so we could just flip the desk from 'mic' to 'line input' and have a whole 'nother set of 48 inputs. Everything was direct-routed. There was only one band that had extra inputs that we had to bus down. Everything else went one-for-one to tape—46 channels' worth of stuff."

Asked about the main challenge of recording such noisy aggressive music, Hewitt notes, "Music is music. The main job we have as a mobile recording studio is to get whatever it is they're playing on tape as well as we can and represent what they're playing. Whatever is coming out of their instruments is what we put on tape. In a case like this, the difference between the Neve preamps and the Millennia preamps might not make as much of a difference as it would in some other music. But we want to get it down as accurately as we can, so that when they take it into the studio to mix or do fixes, it'll be exactly what came out of their amplifiers, so they can set up the rig again, stick the same mic on it, the same signal path and punch in."

I couldn't resist asking about the "family" aspect of recording the Family Values Tour. "Dad and I work together great!" Ryan chuckled. "I've been a drummer since when I was a kid, so I generally like to do the rhythm section, and he likes to do the vocals. The way a console generally gets set up with a rock 'n' roll act is kick, snare and hat on the left side of the desk, so I sit on the left side, and Dad sits on the right. Since I've been working with him so long and watching how he works, we don't really have to even talk about it. There's never a fight about pushing the vocals too hard, pushing the guitars too hard. It's just *there*. We always have a lot of fun. We just turn everything on and *go*!"

TAKE 6 IN TOKYO

MORE THAN MEETS THE EAR

By now, Take 6 is recognized as one of the top *a cappella* groups in the world, thrilling audiences with their always uplifting blend of soul, gospel and jazz. For their first live album, recorded over three nights at the Blue Note club in Tokyo (where they have a large and devoted following), they enlisted engineer Jon Gass, who had worked on a few earlier studio recordings with the group, to capture the magic in concert. Among the delights on the CD are a Motown chestnut ("How Sweet It Is"), the standard "Smile," Elmer Bernstein and Mack David's gritty "Walk on the Wild Side,"

a wonderful take on Miles Davis' "All Blues" (with the singers imitating different instruments) and lots of joyful, harmony-filled gospel.

Offhand, it would seem to be a relatively straightforward assignment for Gass to record the group—six mics on six singers, right? A couple on the piano that sometimes is used as accompaniment. Some room mics? Yet, Gass reveals, "I ended up filling up a 48 [-track Sony digital recorder] pretty much." That was because on this project Gass elected to bypass the Neve console in the Tokyo-based Tamco mobile truck in favor of recording directly to tape through a rack of Avalon M5 mic pre's, and "I ended up splitting off the mic pre's and took all the vocals to tape two ways—with compression and EQ,

RECORDING SPRINGSTEEN LIVE WITH TOBY SCOTT

PHOTO: MAUREEN DRONEY

Toby Scott backstage at Staples Center

Engineer Toby Scott has an extraordinary memory. He can tell you the date that he did his first live recording of a Bruce Springsteen show—November 5, 1980. He can also recall minute details about most of the hundreds of sessions he's done. But even Scott is unsure of how many Springsteen concerts he's recorded in the past 20 years. When we dropped in on him backstage at Los Angeles' Staples Center, where he was setting up to record that night's Springsteen gig, he estimated that it's more than 100. He did promise, however, to check his supremely organized database and let us know for sure.

At Staples, Scott was set up in a spare dressing room/office with the system that he's been using since 1995. Designed by Scott and tech guru Gary Meyerberg, the system was multipurpose from the get-go: At the time it was put together, Springsteen was bicoastal and the rig was intended for use at his home studios in both Los Angeles and New Jersey, as well as on the road.

Main components are a 96-in Euphonix CS2000 console and two Sony 3348 recorders. The system also encompasses a rack of 2-track equipment: two Sony 7000 series timecode DAT machines, two 2800 non-timecode DATs, and two HHB CD recorders. Another rack contains miscellaneous reverbs, including SPX 90s and 90 IIs, a REV7, two Eventide H3000s, AMS DMX and RMX units, and an Ursa Major Space Station. Also part of the package are extensive SMPTE and video sync generation and distributing systems.

Remote trucks were used for Scott's first 1980 recordings and during the tours supporting *The River* and *Born in the USA*. In 1987, while recording the album *Tunnel of Love*, Scott decided to make a pitch for a combination system.

"Bruce's home studio system had grown from the original Tascam cassette desk into 24-track digital," Scott recalls. "When we finished the record and there was the prospect of touring, I did some research and found that for not too much money, I could buy a console and a second tape machine and put together a traveling system. That first really portable system, a 24-track tape machine, an Amek console and all the cases, more than paid for itself." The Amek system sufficed until the end of the *Human Touch/Lucky Town* tour when Scott found himself renting sidecars to accommodate horn sections and background vocals.

"I'd been looking at a Euphonix for a long time," he says. "Then, in '94 Bruce was in the process of mixing with Bob Clearmountain. Bruce had been talking about computer automation for a while, and Bob's studio setup clinched it. Bruce said, 'I think it's time we get some computer

—CONTINUED ON PAGE 184

and without, just in case something was overcompressed or over-EQ'd or something went wrong. It was basically as a safety, but I didn't use much of [the unprocessed tracks]." Gass has been using Avalon gear since 1990, and also employed the company's 2055 equalizers on this recording.

On the front end were Shure Beta 87 microphones for each of the six singers in the group, a change from the Sony 800G mics they've been using in the studio lately. For Gass, the main challenge was quickly adjusting the preamps throughout the singers' two performances at the Blue Note. Even though he worked from a set list, "things would get switched around, and at times I had to guess which songs were going to start out really quiet. Some of them start out at a whisper. There was one song where they started it and the crowd and the dishes were louder than they were! But I've got markings on all the mic pre's where I can pick it up 10 dB, and then I also know where to ease it down." The task is harder than it sounds, since he has to, in effect, "ride" six preamps at once. "It's a one-finger operation, but you have to move really fast," he says. "The mix coming off the board was probably a disaster because I was going nuts on the stacks of mic pre's. But that's how I like to cut vocals, and it worked well for this."

Though the recording went smoothly, Gass admits he did encounter some

—FROM PAGE 183, RECORDING SPRINGSTEEN

automation,' and I bought the Euphonix within three days."

An alternate patchbay was added because Scott needed more patch points than the Euphonix provided. He also preferred a traditional, vertical-style bay rather than the Euphonix top-to-bottom, inline modulars which were formatted in groups of four.

"There's always some sort of video going down," he notes, "so we have patch points for word sync, video sync, SMPTE, AES digital audio... There's never a case of, 'I've got to dig into the back of this rack and then run another cable.'"

These days, on the E Street Band's long reunion tour, Scott takes a split from the FOH mixer's mic setup, which encompasses about 66 microphones, and monitors on Yamaha NS-10Ms. Monitoring, of course, is one of the biggest challenges of recording live, and Scott recalls one of his worst listening experiences: "'Bad' is when we did an outdoor show in Germany at an abandoned airport. The speaker system was A4s, 4 by 4 by 2, and each weighed about 400 pounds. They had those suckers stacked five stories high and 50 feet wide—about the size of a small apartment building. I was 30 feet from them in the back of a truck whose door we couldn't close. When the bass played on 'Born in the USA,' everything in the truck was shaking. I could see my speakers moving, but I really couldn't hear them at all. Luckily, I learned a long time ago how to watch the meters and know what to expect."

PHOTO: STEVE JENNINGS

The 15-year-old, three-CD *Live 1975-1985* is still the only live album released by Springsteen and the E Street Band. And, unfortunately for fans, even with so much great material on tape there are no plans for another one anytime soon. The Sony/Columbia tape vault, where the music is archived, is currently home to about 4,700 Springsteen reels, approximately 1,500 of which are live performances. Before Sony's library was computerized, Scott had developed his own database for the tapes, which he now interfaces with the official Sony one.

"There's not much that we can't find," he asserts. "I can call up the night before, and if need be, they put the tape in a car and get it to us that day." —*Maureen Droney*

Take 6

minor difficulties working in Japan. "It was my first time over there, and there were some language problems," he says. "We got an interpreter from Warner Bros. Japan, and though she knew English and Japanese, I found that engineers have their own language, and unfortunately she didn't know any of our lingo. Things kept getting lost in the translation; it was pretty nutty. It didn't end up causing any major problems, though."

Gass mixed the project on an SSL 9000 at Brandon's Way; "that's where I usually work out of," he notes. He managed to complete about a mix per day there, first working alone and then running the results by the group for approval. Everything on the CD is a complete take of a song, with no fixes. "They're good guys to work with," says Gass. "At this point they pretty much trust me on their [vocal] blend. I grew up singing and harmonies have always been a specialty for me. But they understand their strengths and they play to them; there's almost never a note out of place. So my job was to get that on tape and not mess it up!" he adds with a chuckle.

JOE ELY

AT HOME AT ANTONE'S

It's the year 2000, so that means it's time for a new live album from one of progressive country's greatest performers, Joe Ely. Ely's first live disc, *Live Shots*, came out in 1980 and commemorated his famous European tour with The Clash. In those days Ely's band was sort of country's answer to the E Street Band. *Live at Liberty Lunch*, released in 1990, featured a stripped-down quartet led by guitarist Mark Grissom. Now, *Live At Antone's* showcases Ely's superb current group, which includes guitars, pedal steel, flamenco guitar, accordion, bass and drums. The focus on the CD is on late-'90s material, with eight songs from Ely's three most recent studio albums. That's fine, because this has been a particularly strong era for Ely, whose writing has become deeper and more cinematic as the years have passed. There are also the requisite crowd-pleasers from fellow Texas renegade writers Butch Hancock and Jimmie Dale Gilmore, and some serious honky-tonkin' and driving roots rock. But the Mexican influence that has infused so much of his recent material runs deep on this fine, well-paced and nicely recorded set.

Ely lives on a picturesque spread outside of Austin, so the choice of Antone's, known as "Austin's Home of the Blues," was a natural. "It's a real friendly place for Joe to play so he thought it would be a good place to record a live album," says Charles Ray, who has done sound for Ely in various capacities for much of the past two decades. "Joe's normal mode of transportation for the band is an RV, so what we did is we went to his home studio [see *Mix*, September 1998] and we took some of the gear out of that, put it in the RV and drove it to Antone's. We parked it right outside the club, ran a splitter snake inside and ran power from the stage so we wouldn't have any problems with hums or anything. We have four ADAT XTs and we used two of them along with Joe's BRC [controller] and a time clock to sync everything together. The console was a Yamaha 02R, so it was digital all the way. We used a pair of Event 20/20 speakers to monitor the live DAT refer-

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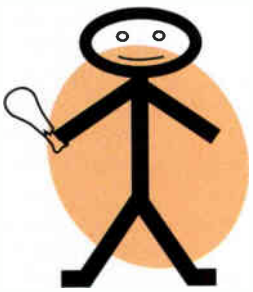

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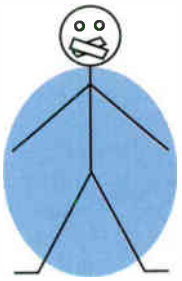

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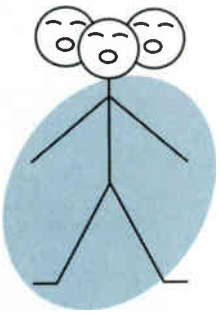
Distortion

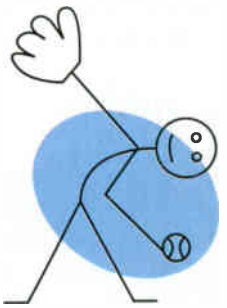
Echo



Chorus

Normalize

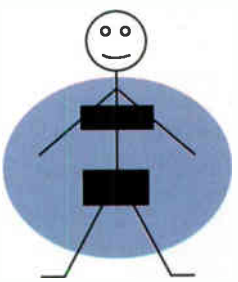
Reverb



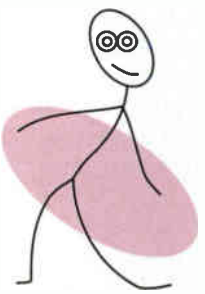
Pitch Bender

Envelope Follower

Parametric EQ



Graphic EQ



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ence we made at the same time we were recording. We recorded two nights, with most of what's on the CD coming from the second night, when the band was really hot.

"The challenge was using the 02R, which is an 8-bus board. Joe wanted to keep it all in 16 tracks. The problem is if you want to go 16 with it, the first eight tracks have to be one-to-one, so channel 1 goes to channel 1 on the ADAT, through 8. Then, on 9 through 16, you can actually assign more than one thing to a channel, so that made the order a little bit strange. I had to go to the second eight to do stereo [submixes]. I took the two floor toms and one rack tom and did two channels with that, made a stereo mix. And I took the three cymbals, two overheads and a hat mic and put them on two channels, so I could pick up two channels. Then, on the background vocals, I split them, because Teye [the flamenco player] sings some, and the bass player sings some, but they never sing at the same time, so I put them on the same track of the ADAT and brought up whichever one was singing on that song. Joe played primarily acoustic guitar, and I put his acoustic guitar on one track and then I used his electric on the same track, but only brought it up on the couple of songs where he played electric."

Ray used a combination of his own mics and ones taken from Ely's studio. These included a Beyer TGX50 on the kick drum, an SM57 on the snare, Sennheiser 604 clip-ons for the toms, AKG SE-300Bs on the cymbals, Sennheiser 609s on the guitar amps and Shure SM58s for the lead and background vocals. The bass and flamenco guitar signals came through a Klark Teknik active DI; the accordion was an XLR direct from Joel Guzman's rig. The room mics, which were placed on the stage on tall boom stands, pointing at the audience and away from the P.A.—were AKG 1000s.

"I had six channels of preamps—four APIs and two Demeters," Ray notes. "Joe's vocal and bass went through the Demeters. We tried to record without much compression or EQ, to get the cleanest recording we could. The digital ended up being really good for capturing the dynamics of the music: When it got quiet, we didn't have to ride the level and we didn't have any hiss. We tried to keep it clean and simple, and when we got the tapes back to Joe's [where it was mixed by Jim Wilson] we were frankly knocked out at how good it sounded. It worked out amazingly well."

WGBH

LIVE ON THE WEB

Boston's WGBH stations are among the most active public stations in the country in terms of producing original programming, which includes concert broadcasts of every variety, from classical to jazz to pop to heavy metal, plus public affairs programming. The WGBH mobile unit does all of this work, but only about half of the mobile's work is connected to the WGBH stations, so the mobile has to scrape and claw for the rest of its business, just like any other commercial enterprise.

Though traditional broadcast work still makes up a large part of the mobile's business, WGBH has also found new work in the suddenly booming world of Internet audio. Beginning this past spring, WGBH entered an arrangement with DiskJockey.com and the Casino Ballroom in Hampton, New Hampshire, to Webcast 10 concerts there. According to WGBH engineer Antonio Oliart, "So far we treat them like a regular broadcast; we haven't really been changing anything about what we do to put it on the Web. That end has been handled by DiskJockey.com."

The first two concerts in the series, by blues guitar phenom Kenny Wayne Shepherd and former Grateful Dead percussionist Mickey Hart and his new band, went off without a hitch. When we spoke to Oliart a few days after the Mickey Hart Band show, he noted that Hart's regular sound mixer, Tom Flye, also took advantage of the WGBH truck to do multitrack recording for the Hart band's own purposes, utilizing the unit's custom Amek Angela console, Sony PCM 800 MDMs (the truck also is equipped with Otari MTR 90-II 24-tracks and a pair of Otari 5050 2-tracks), Lexicon digital reverbs and dbx compressor/limiters. Hart's band carries its own microphones and ancillary processing. Hart's RAMU electronic percussion soundstation (described in *Mix*, December 1998) and Vince Welnick's electronic keyboards were both DI'd; the other members of the band were miked conventionally.

Oliart notes that a Webcast typically lags more than half a minute behind the actual event, and he says that in this case there was no special provision in the truck for monitoring how the music went out on the Web; any kind of compression adjustments were made by technicians at DiskJockey.com after the signal left the truck. So far it's an arrangement where everyone is a winner. DiskJockey.com brings increased traffic to its site, the performers get wide exposure on the Web, and WGBH keeps that mobile unit rolling.

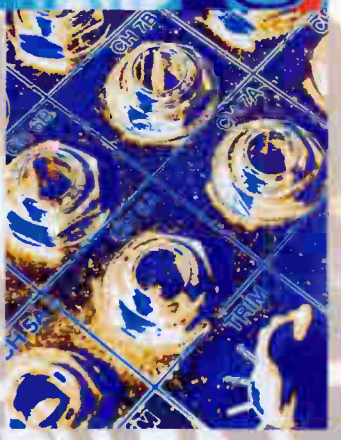
—Blair Jackson

THE CALIFORNIA GUITAR TRIO

RECORDING THEMSELVES

The California Guitar Trio was formed nine years ago by advanced students from King Crimson leader Robert Fripp's famous Guitar Craft courses. In their early days, the trio of Bert Lams, Paul Richards and Hideyo Moriya even toured as an opening act for King Crimson on occasion, but by now they have established solid reputations of their own, based solely on their great technical virtuosity, their marvelously sympathetic ensemble work, their imaginative arrangements of both familiar and obscure works, and their increasingly self-assured compositional chops. The CGT haven't abandoned their Crimson roots, either: They record for the Fripp-run Discipline Global Mobile label, and on their wondrous new live CD, *Rocks the West*, they're helped out on half the tracks by Crimson bassist/Chapman Stick master Tony Levin. (Another Fripp associate and one-time member of Adrian Belew's band, saxophonist Bill Jannsen, also appears on selected cuts.) The CD shows the incredible range of the group's repertoire, with tunes by Queen ("Bohemian Rhapsody"), Ellington ("Caravan"), The Ventures ("Misirlou"), Mussorgsky (*Pictures at an Exhibition*), Beethoven (a segment from Symphony No. 9), various sparkling originals, and even a freeform improvised space jam.

When a Tune Hits...



...you need to respond *fast*—before the magic moment is lost forever. So when inspiration strikes, which would you rather do: bust open your computer, wrestle with IRQ conflicts, and troubleshoot a couple of failed driver installations, or hot-plug a full-blown 24/96 audio recorder/processor/controller/mixer into your computer's (or laptop's) external port and get busy making music?

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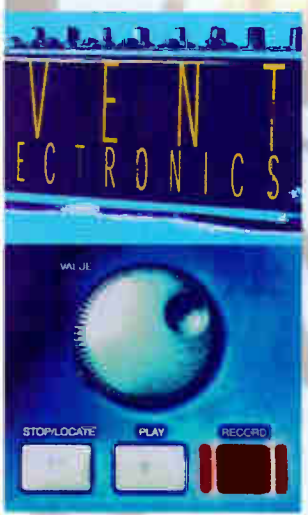

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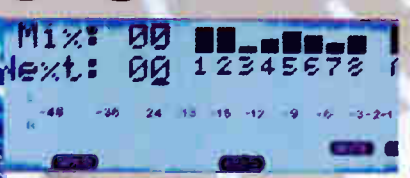

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The CGT mainly plays small theaters and clubs, carrying little but their guitars with them on the road; usually they rely on house sound mixers wherever they're appearing. They've learned to balance their own sound onstage and can easily direct sound personnel to make sure the balance is right in the house. So it's not too surprising to learn that for their live CD they handled the recording themselves. "In general, we've been documenting our live shows for a number of years now," says Richards. "Originally we started with DAT recordings taken from the desk, but then we wanted to get better quality and we wanted to be able to mix it afterwards, so we ended up taking an ADAT [XT 20-bit] on the road with us. That's how we ended up with these recordings. We knew when we were doing these shows with Tony last fall that we wanted to come up with something we could release, so we had the ADATs at the five or six shows we did with him." Venues ranged from the stately Boulder Theater in Colorado to Henfling's, a roadside tavern/biker bar in sylvan Ben Lomond, Calif., where "the sounds from the open kitchen near the stage accompanied the music throughout the performance."

A simple recording technically, but the guitars shimmer and you can feel the electricity onstage and in the crowd, so it's a grand success all the way around.

Richards adds, "We've really simplified it and made it easy to get a good-quality recording on the road. We submix our guitars onstage using a Roland digital mixer, the VM1000 Pro. That has the capacity for digital outs and has a little box that sends a Lightpipe out to the ADAT, so it makes it easy to hook up to the ADAT without having to go through all the D-to-A converters onstage. So we put the ADAT onstage and go directly into it. We use 60-minute tapes, so we only have to change once, and we usually plan our tape changes while I'm speaking. Hideo Moriya has a tape sitting there ready to pop in, so we don't have to bother the engineers with it. Hideo also has a little MiniDisc that he records on, so we have a stereo copy on each show.

"Over the years, we've spent a lot of time finding a way to get our direct signal not only for the live sound in the room, but for recording, as well. We tried many different types of electronic pickups and different guitars even. We used to be Taylor guitar artists. Before that we used Ovation guitars. Now we're using guitars custom-built by Ervin Somogyi; he puts out about 20 guitars a year. We outfitted them with a combination setup: Under the bridge there's an EMF B-Band pickup, which is made in Finland. Then in the sound hole there's an EMG magnetic pickup, and we blend these two and they go straight into the Roland mixer, and from that into the ADAT. Tony went straight in via a DI into our mixer, then into the ADAT.

"One of the big keys to these recordings, though, was the ambient mics in the room, for which we have to give a lot of credit to our friend Brian Lucey, who mixed the record at his studio in Ohio and was sort of our live sound advisor. He hooked us up with this matched pair of Audix CX-101 large diaphragm mics, which we put up on a shock-mount and then found a strategic location for in the room. The direct sound that we get from the guitars is fairly flat, so it was important to get something from these good-sounding room microphones; the key was the placement. It didn't work at every place we played, but we had more than enough for the CD."

Richards and Brian Lucey mixed the tapes at Lucey's Magic Garden Studio in Columbus, Ohio. "We added a bit of EQ, but mostly left it alone," Richards says. A simple recording technically, but the guitars shimmer and you can feel the electricity onstage and in the crowd, so it's a grand success all the way around.

PONCHO SANCHEZ

PRIMAL PERCUSSION

Latin Soul is the latest CD from Poncho Sanchez, whose illustrious career spans 25 years (including seven with Cal Tjader's influential Latin jazz group) and encompasses 21 albums as a leader, most for the Concord Jazz label. Latin music has traditionally been recorded live in the studio with minimal overdubbing, so

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live albums usually don't sound tremendously different than studio records, but there's no question that a band like Poncho's really comes alive in a club, and *Latin Soul* documents that fact masterfully. On this CD, the veteran percussionist fronts an eight-piece band that is very heavy on the percussion, as you might expect; in fact, even the horns seem to function as melodic percussion at times, with their peppery blasts. Congas, timbales and bongos take center stage with this group, whose fiery Latin rhythms never lag for a second—it's quite a display of both energy and finesse, as the parts interlock and dance with each other, but never sound cluttered; quite a feat.

Produced by John Burk, Sanchez and pianist David Torres, the CD was recorded by Phil Edwards, whose company, Phil Edwards Recording, has been an important fixture in the San Francisco Bay Area for many years. Though Edwards has worked in every genre imaginable, he specializes in jazz, Latin and gospel dates up and down California. His truck is well-outfitted with a vintage 40-input API console with an API sidecar, Otari MTR multitracks and 2-tracks, Dolby SR and A, UREI Time-Align speakers, the requisite complement of the latest outboard gear, and an impressive selection of old and new microphones. In a concession to changes in the recording industry (read: smaller recording budgets) Edwards has also added 64 tracks of DA-88; in fact, he says the overwhelming majority of work the truck does now uses the MDMs. "Back in the analog days, nobody worried about spending $150 a roll for a half-hour of tape, but now it's a huge consideration," he says. "Everyone has to change with the times. And that means MDMs and more and more inputs. I've got 72 now and I suppose it's not enough, but I'm tired of fighting the input wars," he says with a laugh.

"There's a perception now that to record a concert all you need is an ADAT, and then you take it home and mess with it in Pro Tools and you've got an instant record," Edwards continues. "Then, on the high end, you've got guys who can't record something unless it's going through a $10,000 preamp. And there's a lot in the middle. Doing a remote *right* still takes a lot of preparation, because there are a hundred things that can go wrong with the cabling and interfacing and all that. I have a truck and it's self-contained, but it still takes us four or five hours to get it all together, and before you even get to that stage, I spend hours thinking about mics and setups. I don't know how anyone does it by just throwing things in the back of a room and making it all go; that's a mystery to me."

The *Latin Soul* CD was drawn from two shows three months apart at Yoshi's nightspot in Oakland, Calif., and the Conga Room in Los Angeles. Edwards recorded to DA-88s, with the mics routed through the API 312 preamps in his consoles. The main console also has API 550A equalizers. Edwards talked about his miking scheme:

"Everything seems to take more mics than they used to. Timbales used to be just a couple of overheads, but not anymore. Now it's a mic each for two to four drums and a couple of cymbal and they might also have a cowbell and woodblock. There's this technique called *casceda*, where they take the stick and hit the side of the drum and it makes this tinny, percussive sound, but if you put a mic right on it, it fattens up. So over the years I've been adding a mic on either side [of the timbales], and now I'm doing six to eight mics on the

timbales alone. For the overheads we probably used 451s or maybe 460s—small-diaphragm condensers. I had 421s on the drums themselves. I still like miking them over on the fatter side of the drum, but P.A. guys seem to like it on the bottom. For the *casceda* I usually use these old SM56s, which are a lot like SM57s. They're good for anything that is really hot and really percussive because they never overload; they have a nice little peak at around 5k. I think on Poncho's congas, we miked each drum with 421s or 56s. Poncho also played a set of timbales on one song, but we only used three mics on it. On the bongo I used a single 56 underneath, right at his feet.

"For the bass we took two Countryman directs, including one off the back of the head, and we also put a mic on the speaker. Then, depending on the track situation, we'll either print those on separate tracks or combine them. Then you've got three horns: tenor, trumpet and trombone. For the tenor we used a U47 FET; the trumpet, I believe, was an RCA 77 ribbon mic. There's something that's very flattering about those mics for trumpets. They roll off very smoothly at about 7k, which is nice. I recently used a Royer on a trumpet player and I liked that, too. On the trombone, I think we used either a 47 or an 87.

"Then there's the drum kit, and that was pretty much standard stuff: 421s on the toms, 56 on the snare. I don't do the top and bottom [snare] routine: When I want to get some snap I just put some extra EQ on top. I usually use a KM84 on the hat, and we'll usually go with 451s on the overheads. I still like a 421 or something of that genre on the kick. For vocals I used an SM85, which is a vocal condenser that's a discontinued model; it's very bright. For piano what I characteristically do is three mics: low, mid and high, and on occasion I'll use a C-ducer. Then I had three or four mics for the audience. In all I probably had 36 inputs."

Even with all the close-miking, bleed was still an issue; that's the nature of the beast when so many percussion instruments are involved. Another factor Edwards had to deal with was the plethora of floor wedges that "were lathered all over the stage," he says. "Plus they had sidefills! So you isolate as well as you can and when it comes to fixes later you do what you can."

In this case, the fixes (mostly in the horns, which isolated well) and mixing were the responsibility of Ron Davis, an independent engineer who was on staff at PER for five years. Working at One on One South in L.A., Davis transferred the DA-88 tracks to 3324 and then, with the production team, fine-tuned the mixes. Eight of the 10 cuts on the CD came from the Conga Room show, which was the second of the dates recorded. "At Yoshi's we tried a couple of things in recording the timbales that I wasn't totally happy with," Edwards notes. "But at the Conga Room I thought we did everything the way we should have. It's nice that we got a second chance, because in this business that's not always the case." ■

—FROM PAGE 178, COOL SPINS

like the hothouse by-product of a schoolboy enthralled by the Smiths' catalog and Merseybeat. But it's fitting: After all, the band's first album, *Tigermilk*, was the result of Murdoch's music business school course. Since then, B&S have been getting straight A's on their musical term papers, and their fourth album, *Fold Your Hands Child, You Walk Like a Peasant*, is no exception. Adventuring into a variety of musical styles, the almost-too-sweet arrangements retain the previous records' off-kilter, tumescent loveliness, tracked as they all have been by engineer Tony Doogan at CaVa Studios in Glasgow. Tubular bells ring in "Beyond the Sunrise" with a sound reminiscent of Lee Hazlewood's cracked psychedelia. "The Model" takes a swing down a Left Banke brand of chamber pop. "I Fought in a War" swells with strings and twangy Rickenbacker, conjuring the menacing, romantic drama of an Ennio Morricone score. "Don't Leave the Light on, Baby" marries Wurlitzer-steeped R&B bedroom balladry with characteristically transgressive, witty lyrics. These apt pupils are clever enough to know that artful, humorous lyrics such as those on "Nice Day for a Sulk" and "There's Too Much Love" make the sugar pop slide down easier.

Produced by Belle & Sebastian and Tony Doogan. Engineer: Doogan with Willie Deans and Ian Grier. Studio: CaVa Studios (Glasgow, Scotland). *—Kimberly Chun*

A Perfect Circle: *Mer de Noms* (Virgin)

APC offers a glimpse at the hard rock scene that might have been and *should* have been. Tool frontman Maynard James Keenan and guitar/production prodigy Billy Howerdel (who spent the better part of the '90s behind-the-scenes with NIN, Tool and Smashing Pumpkins) present an updated take on a genre many had considered lost to baggy jeans and down-tuned 7-string guitars. Howerdel, here present as both a producer and a songwriter, thankfully eschews the omnipresent trap of self-indulgence; his focus is

on songwriting and keeping enough sonic landscape open for Keenan's bone-chilling vocal arrangements. APC bring melody and thematic substance back into view while showcasing a clear understanding of the musical options afforded by technology. On the first listen, many might dismiss *Mer de Noms* as Tool-lite, but subsequent spins will reveal an entirely different and unique beast that effectively raises the bar in a genre that desperately needs it.

Producer: Billy Howerdel. Mixing: Howerdel and Alan Moulder. Mastering: Eddy Schreyer/Oasis (Flint Hill, VA). —*Robert Hanson*

Various Artists: *OHM: The Early Gurus of Electronic Music: 1948-1980* (Ellipsis Arts)

The Ellipsis Arts label has given us many fine compilations of unusual music through the years, including CDs of music created on unique musical instruments. Their latest, a three-CD set of electronic music pioneers, continues this fine tradition of nicely packaged, splendidly annotated works that have academic as well as aesthetic intentions. With more than three-and-a-half hours of beeping, bleating, whirring, swooshing, rumbling, onomatopoeia-defying electronic compositions spanning more than three decades, there's an awful lot to digest here, and in most cases this is not easy listening, to say the least. But there is a surprising coherence to the set; perhaps experimentalism in itself is a unifying factor. Difficult cacophony sits side by side with com-

positions of astonishing grace and beauty. Many of the best-known names from the electronic music world are represented here—early practitioners such as Olivier Messiaen, John Cage, Edgar Varesè, Karlheinz Stockhausen, Raymond Scott and Milton Babbitt; '60s explorers such as Steve Reich, Pauline Oliveros, Morton Subotnick, Terry Riley and La Monte Young; and contemporary composers such as John Chowning, Brian Eno, Jon Hassell and Klaus Schulze. The accompanying 100-page booklet offers a cogent history of the different streams of electronic composition and comments about each work from the composer him/herself. I don't pretend to like or understand a fair amount of what's on here, but I do appreciate the encyclopedic scope of the project; it makes a great starting point to investigate some fascinating terrain.

Compilation producers: Thomas Ziegler, Jason Gross. Executive producer: Jeffrey Chamo. Premastering: Darren Neudorf. Mastering: Toddio/Chateu Shag (Vancouver). —*Blair Jackson*

Built to Spill: *Live* (Warner Bros.)

Cobbled together from the splintered remains of the Boise, Idaho, band Tree People, Built to Spill is an unlikely live fave. Bearded vocalist/guitarist Doug Martsch resembles a burly mountain man, not a Backstreet Boy, and in concert, these guys' guys don't come with any strings or bungee chords attached. They're workmen who continue to toil in the much-maligned garage of grunge. So it's not shocking to hear a

straight-ahead cover of Neil Young's "Cortez the Killer" on BTS' latest, *Live*. Their powerful, rhythmic rock aspires to some of the ragged glory of Neil Young, and Martsch's plaintive, wail sounds just like the grunge godfather's. The band also give a shout out to other Northwestern indie bands such as Love as

Laughter and the Halo Benders. Covers by those groups are coupled with recent performances of BTS songs such as "The Plan" and "Broken Chairs," which boasts a "solo"—a furious, spiraling burst of noise—by Martsch. Delusions guitarist Jim Roth and Caustic Resin guitarist Brett Netson that would also do Young proud. Produced by longtime collaborator Phil Ek, *Live* is as good an introduction as any to this band, who have made a virtue out of building solid castles of straightforward guitar rock, ornamented with unexpected emotion and a sweeping melodicism.

Producer: Phil Ek. Engineers: Steve Lettie, Frank Papitto, Stuart Hallerman and Bob Ferbrache. Audio assistant: Frankie Fulleda. Recorded live at Irving Plaza (NYC), The Showbox (Seattle) and Bluebird Theater (Denver). Mastering: Ek and Greg Calbi/Sterling Sound (NYC). —*Kimberly Chun*

***Buena Vista Social Club Presents Omara Portuondo* (World Circuit)**

The CD-buying public seems to have an insatiable appetite for anything connected even tangentially to the original *Buena Vista Social Club* album or Wim Wenders' popular documentary of the same name. What's remarkable is that every "solo" album that has followed in the past couple of years has been worthy on its own merits. The latest, by the expressive alto singer Omara Portuondo, once again takes us back to the Cuba of a bygone era. Portuondo was a popular singer and dancer in the pre-Castro '50s, when nightclubs dotted the streets of Havana and tourists happily sipped rum drinks and danced the night away under warm, tropical skies. This CD captures some of that feeling—there are swelling

string arrangements, creamy horn and reed parts and gently flowing Latin rhythms. It's a largely relaxed affair from beginning to end; a little night music for (and about) lovers. Portuondo's voice wraps around the lyrics like a warm caress, and she easily moves from the emotion of one song to the next. Many of the tunes are old big band-flavored numbers, but there's also a lovely Spanish version of the Gershwins' "The Man I Love." Other BVSC alumni helping out include singer Ibrahim Ferrer, pianist Ruben Gonzalez and guitarists Compay Segundo and Eliades Ochoa.

Producers: Nick Gold and Jerry Boys. Tracking and mixing engineers: Boys and Simon Burwell. Studios: EGREM (Havana; tracking), Livingston (London; mixing). Mastering: Tom Leader and Boys. —*Blair Jackson* ■

COAST TO

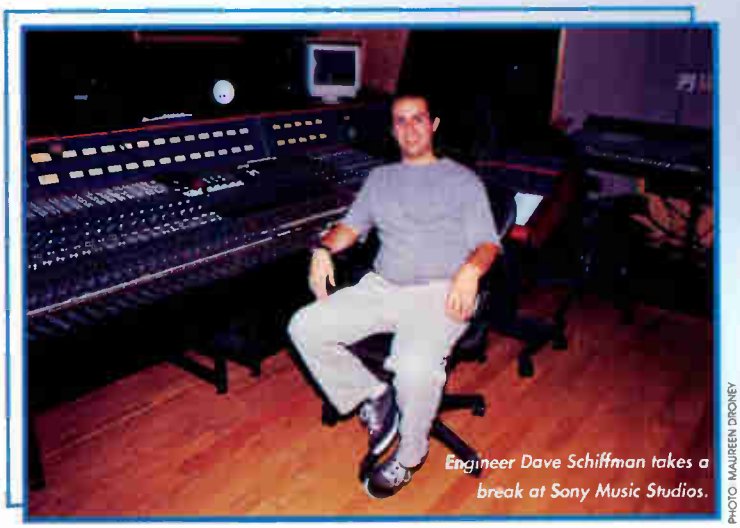
Effanel Music owner Randy Ezratty (foreground) and lead mixer John Harris at the studio's new AMS Neve Capricorn console.

PHOTO: NILS WALTER

L.A. GRAPEVINE

by Maureen Droney

Over at Sony Music Studios, I found engineer Dave Schiffman recording the Patrick Leonard-produced solo debut for Ronan Keating, vocalist with the British pop band Boy Zone. Originally from New Jersey, and a onetime staffer at both Skyline Studios in New York City and Ocean Way Recording in L.A., Schiffman has more recently kept busy working with producer Rick Rubin on Sheryl Crow's Grammy-winning "Sweet Child of Mine," projects by artists such as Red Hot Chili Peppers, Tom Petty and Johnny Cash, and soon-to-be-released efforts by Eagle Eye Cherry and Palo Alto. Schiffman, a fan of classic gear who seemed quite happy working on Sony's 40-in Neve 8078, has also just finished mixing for new Warner's act Mephisto Odyssey.



Engineer Dave Schiffman takes a break at Sony Music Studios.

PHOTO: MAUREEN DRONEY

At Sony, Schiffman—along with keyboard tech Todd Shoemaker, programmer Dave Channing and assistant engineer Sam Barela—had put together a hybrid setup that was a flexible combination of live musicians, MIDI interfaces, digital and analog.

The ace band, all previously members of the sonically legendary Toy Matinee, included drummer Brian McCloud, bassist Guy Pratt and guitarist Tim Pierce, with producer Leonard on keyboards. "They're all amazing musicians," commented Schiffman. "Pat will come in with the chart, they'll work it out, and two takes later, it's a song. It sounds like a record already with just the four of them."

The live tracks were being laid down to Studer 827 analog on BASF 900, but also interfaced into the system was Pro Tools and, with a Mackie sidecar mixer, Leonard's RADAR system. "Our challenge was to be able to marry everything," explained Schiffman. "Pat wanted to be able to reference back to the song

—CONTINUED ON PAGE 198

NY METRO REPORT

by Gary Eskow

Effanel Music turns 20 this year. Although the company is firmly established as one of the major remote recording operations in the greater metropolitan area, Effanel is changing with the times and the shifting nature of the business, says owner Randy Ezratty. The company has expanded to include audio post services at its West 25th Street facility, and Ezratty recently purchased a second AMS Neve Capricorn console.

"More than ever, it's important to maximize your resources—equipment and personnel," the owner explains. "I've got seven people working here, and two of them [lead mixer John Harris and Adam Blackburn, otherwise known as "Effanel's Next Big Thing"] are talented and sought-after mixers. We're not recording at remote locations every day, and so we needed to provide a place for them to be able to work further on the live concerts they've recorded.

"L7, our 48-foot, expanding-wall, mobile recording studio is the ultimate physical manifestation of Effanel's contrary ways," Ezratty says. "In 1980, the company was founded on the then-novel premise that you didn't need a control room or a truck to make good multitrack recordings. We built an entire portable recording system around John Stephens' brilliant 120-pound, 24-track, flight-cased tape recorders. We took that system all over the world—Mick Fleetwood in Ghana, Paul Simon in Zimbabwe, Peter Gabriel in Greece and U2 in Ireland [*The Unforgettable Fire*].

"In 1996, when miniaturization and portability had become commonplace, John Harris and I decided to build L7, the biggest—and, in our opinion, the baddest—mobile recording studio in the world," Ezratty continues. "Producers and artists really responded to the space. And with its 14-foot [expanded] width and 10-foot ceilings, we had built an ideal surround-mixing space just in

—CONTINUED ON PAGE 201

COAST

NASHVILLE SKYLINE

by Dan Daley

Spring was a time of rebuilding in Nashville. No real tornados had touched down, at least as of May. But the whirlwind in the wake of the music industry's massive two-year consolidation had left its own trail through the city's music community.

Apparently it's not over. Arista Records/Nashville was waiting for the other shoe to drop in the wake of a corporate/political imbroglio in New York, and rumors were rife in Nashville that Asylum Records would close shop, further reducing the number of labels that feed work through the city's studios.

That hasn't stopped several studios from refurbishing and contemplating upgrades.

PHOTO: ROBERT AMES COOK

Quad's second new studio will be identical to Studio A pictured here, and will also include an SSL 9000J desk.

Emerald installed the city's first Euphonix System 5 digital console (see "Nashville: The World's Most Active Studio Market" on page 88), and at Sound Kitchen, the studio's main tracking room, "Big Boy," got a new console, a custom-built, fully discrete, 80-input API Legacy Plus. The new API replaced the 60-input Neve V3 Legend, and the Neve was being moved to Sound Kitchen's Courtyard studio, which is often booked by producer Brown Bannister. There the Legend would replace a vintage 48-input Neve 8108, which was slated to be sold.

Aside from the obvious pattern of increasing the number of inputs available in two studios, facility co-owner Dino Elefante says that the change in consoles reflects a need to provide warmer-sounding boards as the use of digital media increases. "The harsher the recording medium, the warmer the console has to be," he explains. The first project on the new API was scheduled with country duo Brooks & Dunn.

At Quad Studios, owner Lou Gonzales tells me he expects to start

—CONTINUED ON PAGE 202

PHOTO: DAVID GOGGIN

Rickie Lee Jones (foreground left) completed her upcoming CD at Record One in L.A. with help from co-producer Bruce Brody (foreground right) and engineer Larry Alexander (standing L to R) and assistant engineer Tom Sweeney.

SESSIONS & STUDIO NEWS

SOUTHERN CALIFORNIA

Rickie's in love—with her new Artemis album, which was recorded at Record One (L.A.). Rickie Lee Jones, Bruce Brody and Ben Sidran produced; James Farber and Robert Smith engineered; and Larry Alexander handled additional overdubs and mixing...Christina Aguilera overdubbed a track produced by Celebrity Status, Ron Fair and Don Sebesky for RCA at Signet Soundelux Studios (L.A.). Mike Ross engineered; Brian Dixon assisted. In the film score world: Engineer Steve Kempster mixed composer Mike Mancina's score for Castle Rock's *BAIT* with assistance from Tulio Torinello. John Richards mixed composer George Fenton's score for the Columbia film *Center Stage* with assistant Tulio Torinello...Orgy got the recording and mixing treatment from producer David Kahne at Scream Studios in Studio City. Kahne and Rob Brill engineered. Chris Vrenna (formerly of Nine Inch

—CONTINUED ON PAGE 203

L to R: Assistant engineer Marc Molinas, Savage Garden's Darren Hayes and engineer Peter Barker at Sony Music Studios, Santa Monica

—FROM PAGE 196, L.A. GRAPEVINE

demos he'd cut on RADAR, to sequence off of his MIDI system and to play live with the band. We've also pulled a sample or two off the RADAR to make loops."

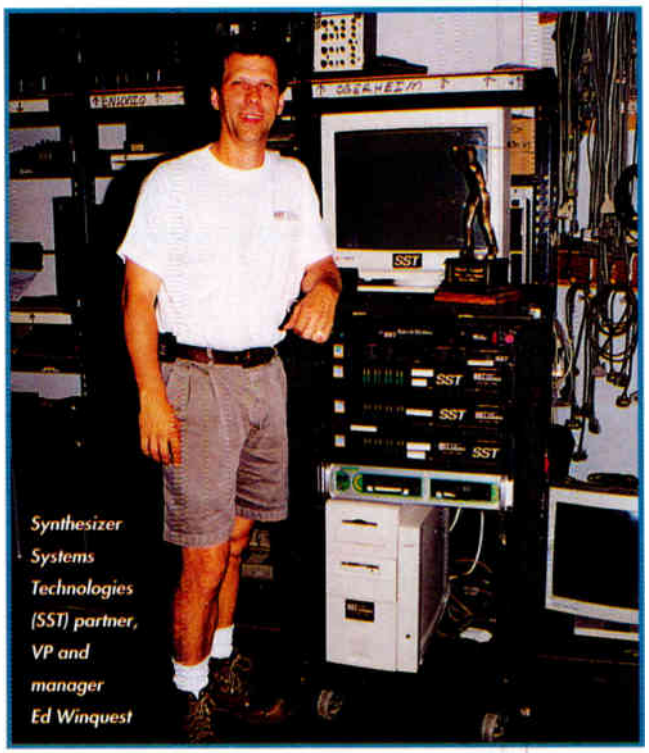
Hybrid-style recording is just fine with Schiffman, who is comfortable moving back and forth. "I'm not really sold on total Pro Tools digital technology yet," he commented. "It's still missing that depth to me. For some stuff, it's great, and it definitely has its place. But I still think live instruments—especially drums, bass and guitars—come back sounding better off analog. For me, because digital doesn't really do anything to the sound, it doesn't help it either. Pat's into both digital and analog, so we've got the best of both worlds going. After we have a complete track, we drop it into Pro Tools to do any little nips and tucks that need to be done, then we'll punch those back into the existing analog tracks. If there's a drum fix in the first two bars of the chorus, we'll just punch those first two bars and try to retain as much of the true 'analogness' as possible."

Plans for the project were to record most overdubs directly into RADAR or Pro Tools. "That's a great way to do vocals," Schiffman asserted, "in that you have a ton of tracks and you're able to move around and comp so easily. Dave Channing is Pat's Pro Tools guy, and he's phenomenal at it."

A tour of the recording setup showed that Sony's piano had been moved into an iso room to provide a comfortable tracking environment for the band, whose personal spaces surrounded McCloud's baffled-off drums. C12VRs were in use on overheads, with close ambience mics including an M149 tube and an AEA RCA44 reissue. "They wanted a tight sound," said Schiffman. "Even though the room here is not huge, it can be deceptively roomy-sounding. We threw these four baffles in here, did a bit of a tunnel on the bass drum, and it totally tightened up the kit."

Guitarist Pierce's extensive (and neat!) setup included something a bit unique. "Tim has lots of toys," Schiffman said with a laugh. "One thing I especially like is that I can put an SM57 on his amp that he runs back into his rig. It goes through his own mic preamp, then through whatever effects he wants, and he gives me two DI outs. That gives us the direct sound, all his effects, and I'm also mixing in the cabinet as well. It makes for a nice, wide stereo sound."

Sony's 12-in (eight mono, two stereo) Private Cue brand headphone system seemed to be a hit on the session. Coincidentally, the system was first developed at Skyline Studios where Schiffman had been a beta tester for it. "It's brilliant for tracking," he said. "It sounds great, and it gets loud enough. It's nice to be able to set it up for the musicians and then not have to deal with mixing headphones. Most musicians love it."



Synthesizer Systems Technologies (SST) partner, VP and manager Ed Winquest

Schiffman himself, of course, carries a rack, albeit one fitted with fairly esoteric gear. It includes a U.S. Army Corps Federal limiter ("I can't explain what it does, but if you mix it in with something, it gives a little more punch"), Anthony DeMaria limiters, a Nightpro EQ3D ("very 'Pultecian'—it has this thing called the 'air bus' where you can get in really high—sometimes it works great on the stereo bus"), and Neve 2254s ("the best compressors ever invented").

Meanwhile, Sony Studios manager Roger White told us about other improvements made to the facility since the Neve was installed. The CR's front wall was rebuilt, a 32-inch flat screen video monitor was installed, and the TAD/Augspurger mains were flipped over to provide a bigger "sweet spot." An Otari UFC (Universal Format Converter) is now standard equipment in the room. Since the 8078 came online, projects have included country superstar Tim McGraw, with producers Byron Gallimore and James Stroud; producer/engineer Elliot Scheiner recording vocals with Olivia Newton-John; and saxophonist Dave Koz cutting tracks with producer Jason Miles and engineer Joe Chiccarelli.

All the studio managers in town have Synthesizer Systems Technologies (SST) in their Rolodex, and most probably make the company their first call for keyboard rentals. But until I stopped in at SST's shop for a visit with partner, VP and manager Ed Winquest, I didn't realize just how much gear the company has available, including one of the largest vintage keyboard collections in the country. In business since 1987, SST was one of the first rental companies to realize the potential of computer-based systems, and over the years, they've continued to expand in both digital and vintage directions. From Pro Tools and other digital recorders, the latest in samplers, digital keyboards, storage mediums and interfaces, to vocoders, B-3s, Clavinets, Moogs, ARPs, Wurlitzers and assorted accordions, these guys have it covered. And they know how to work them all!

Winquest, who came to L.A. from Omaha, Neb., and started in the rental business at Audio Rents, is, of course, a keyboardist himself and he has toured worldwide in bands. He remains genuinely excited about the gear that he rents. "A lot of people don't know that we rent ADATs, DA-88s and Pro Tools," he said. "But it's logical because our main focus is computer synthesizer systems. We were actually one of the first companies to rent Pro Tools; we were doing it back when it started as Sound Tools. It came easy for us because we were already doing Performer, Vision, Cubase—all that stuff. Now we specialize in it and have several systems."

While SST ships all around the world, they cater to a studio clientele, rather than a touring one, which may explain the excellent condition of their equipment. Everything gets a thorough checkout upon return, and there are ca-

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bles, manuals and sound libraries for everything. "We're available 24 hours a day," stated Winquest. "With staff in the shop from 8 a.m. until 11 p.m. After that, the pages go to me."

Between Los Angeles and the 4-year-old Nashville branch of SST, the company has a dozen employees, most of them musicians. "We have a great staff," Winquest continued. "We don't have much of a turnover. All but one have been here five years and up; the youngest one has been here two years. For us, SST has always been a service company. It's never been 'go out, drop it off and leave it.' We follow up with the clients. Electronics are electronics, and there are bound to be isolated instances where equipment or software goes down, but we'll always get you a new one as fast as we can. I think people respect us for that."

SST stays in touch with manufacturers and on top of trends. "Pretty soon modeling will be standard," Winquest predicted. "Taking a snapshot of a Minimoog and putting it on a chip so you can call up the Minimoog and play it in your computer. They're already doing it with speaker modeling, like on Roland's VS1680, and Antares' new box is a microphone modeler."

Current popular units are E-mu's Planet Phatt and Orbit. "They're great for the dance people," Winquest explained, "because they sync to MIDI timecode and do arpeggiations and things like that. Then, a lot of the synths coming out now give you that analog control again, making editing much less frustrating. Like the Novation Supernova, which is great for both sound and versatility—it's got the richness of a good old Prophet 5 that a lot of guys are looking for. A lot of people like Korg Trinitys and Tritons, because you can get your sound without doing a lot of editing. And the Roland Vdrums are really exciting. They feel like the real thing but trigger samples so you can push a button and get the sound of a 1969 Ludwig kit."

So what's Winquest got in his own home setup? "A D70 that I use for my master keyboard. It has that great string patch called 'Slow and low,' and it's a good controller keyboard as well, with 76 keys. I have my computer set up with Digital Performer and modules—a TR rack, a Planet Phatt. I'll interchange things depending on what kind of song I want to work on. And," he said with a laugh, "I'm testing out the Vdrums at my house right now. I had to arm wrestle my partner for them!"

SST is obviously not just a business for Winquest. "I love it," he concluded. "I get to check out everything that comes through the door. I've never gotten bored with it, and I don't think I will. And I love meeting the people in the business. I like to talk to our clients on the phone myself whenever I can. People know that we're here, that they'll get a good price from us and that we'll take care of them."

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—FROM PAGE 196, NY METRO

time for DVD. The upgrade to a Capricorn digital console three years ago sealed our fate. With L7 and Capricorn, it was now possible for us to handle huge live shows that would have previously required two trucks. And in between remotes, we were booked solid, mixing CDs and DVDs. Post-production in L7 became so popular that we replicated its setup in our Manhattan studio."

Ergo, a dedicated move into the audio post field. "Correct. Remember, it takes time for our truck to get from point A to point B," says Ezratty. "While it's on the road, our guys are available. Over the years, clients have asked us to continue working projects through post. The Capricorn that we take on the road ends up with lots of data written into its memory. With the addition of a second, 72-fader console in-house, we can take that data and keep mixing a project while the truck heads off to another remote location."

The creative aspects of refining a mix balance out the highs that come with working live in the field. "We all got into this business because of the rush of live recording," Ezratty continues, "but we've been doing it a long time. Refining the work in post is part of our growth. Mixing and posting involves diving into the subtle aspects of the music, things that live recordists traditionally haven't had the opportunity to experience. DVD has particularly opened that area up for us. Right now we're mixing a Santana DVD. It's very exciting, but we're on week three of the project, and we can't wait to head off to Carnegie Hall tomorrow night to record Keith Jarrett."

Effanel has two 5.1 mixing environments, one at the studio and a second in their 14-foot-wide truck—that's the hydraulically expanded size it reaches on location, not the 8-foot width you pass somewhere north of Suffern on the New York State thruway. "My main comment about 5.1 mixing is that it's essential to commit to a monitoring system and not just bring in a couple of extra speakers," he says. "We voiced our room and our truck for our monitors. Before settling on our current Spendor 500 system, we bought more than one set of monitors. The Spendors are incredibly accurate and musical.

"Capricorn is also a fantastic platform—sonically spectacular and so refined in terms of its digital processing. The whole thing with any digital console is its power. We typically set up our A-to-Ds [either the Capricorn's own 20-bit converters or Apogee 8000s, which are 24-bit] next to the mics onstage. The signal is sent down a half-mile of fiber-optic cable to the board, and it's always crystal clear and in your face.

"I also want to point out how much we love our Otari RADAR II system," Ezratty continues. "It's joined at the hip with the Capricorn. It's a gorgeous-sounding hard disk recorder. We've gotten to the point where if we know we'll be mixing a project that starts out in another truck we'll specify that the client track to RADAR."

Harris has witnessed the evolution of Effanel, and the live recording business, since he started working at the company about a dozen years ago. The perennial choice as lead mixer for the Grammy broadcast, Harris recently won an Emmy for his work on the show. He also has handled live sound on numerous *Unplugged* segments.

"Much has changed since I began my career as a live recording specialist," says Harris. "Most of it for the better. It used to be that the guy who recorded a live performance hardly ever saw the tapes after the show. In most cases, the artist's studio engineer would mix the recordings, sometimes with great results, but more often than not, losing the energy and the essence of the performance. But as our craft has matured, some of us road guys have been invited to take our recordings through the final mixing stages. And I couldn't be happier. One skill bolsters the other.

"As for tools, the advent of high-powered digital consoles has been the greatest single step forward in our endeavor to faithfully capture an artist's performance," he continues. "With my trusty Capricorn console in tow, I've been able to generate real-time broadcast mixes that have led more than a

few artists and producers to ask me to mix the CD and DVD afterlifes of their live performances. The 5.1 format is ideal for concert recordings, and I've enjoyed 'pioneering' that mixing style with DVDs by Santana, the Dave Matthews Band, the VH1 *Divas*, and Eric Clapton." ■

E-mail New York news to Gary Eskow at scribeny@aol.com.

—*FROM PAGE 197, NASHVILLE SKYLINE*

work on a second new studio before the end of the year. The facility will be identical to the other new one at the Nashville location and the five studios at Quad's Manhattan site. The new studio will also be outfitted with an SSL 9000 J console, and the design will be Gonzales' own, as are all of his other studios.

Nashville's Quad has been doing well during the months Gonzales has owned it, because in large part, Gonzales rerouted New York clients to Nashville. Those include urban producer/artist Stevie J, who has produced hits for Madonna and who block-booked nearly two months in the Nashville facility. As a result, those clients pay a somewhat lower rate than they would pay in New York City for the same studios and technology but a higher-than-average rate than facilities are getting in Nashville. Gonzales says, however, the second new Nashville studio—which will comprise two of the three remaining original Quad rooms in addition to an extension to the building—isn't for overflow but rather to get more Nashville-based business into the facility. "That's what I came down here for in the first place," he says. "I like country music. I'd like to get some of it in here."

Poppi Studios, which had served Nashville's alt-rock and independent rock music sector for six years, closed its doors in May. Neal Cappellino, the one-room facility's owner and chief engineer, says that the same factors that had been affecting Nashville's other studios eventually caught up with his business: namely, the proliferation of home studios and an overall downturn in music recording.

The closing of Poppi adds another dimension to Nashville's reorganization as a market and underscores the fact that the entire record industry is changing, not just the country music market. Nashville's non-country music commu-

nity is large and diverse, but it has seen a few breakouts in recent years. Bands such as Sixpence None the Richer and the Evinrudes have been beacons for Nashville's pop industry, but they have not provided enough stones to pave an alternate highway in and out of town.

Cappellino does observe a silver lining to the situation. Artists who have passed through the facility during the last three years are now calling him for freelance engineering work, something he had wanted to do more of anyway. "The studio turned out to be very much a springboard for a freelance career for me," he says. "So in that regard, it definitely served a purpose."

E-mail Nashville news to danwriter@aol.com or fax 615/646-0102.

—FROM PAGE 197, SESSIONS & STUDIO NEWS

Nails) was also in producing "Gangsta Bitch Barbie" for Den Music with mixer **Bill Kennedy**. **John Travis** (**Kid Rock**) produced and mixed the debut CD by **Tom Ewings**...At **Sony Music Studios** (Santa Monica), **Darren Hayes** of **Savage Garden** unearthed his innermost thoughts during some live radio interviews. Producer **Mitch Maketansky**, engineer **Peter Barker** and assistant **Marc Molinas** were on hand...Punk progenitors **The Vandals** tracked their latest Nitro release at **Grandmaster Recorders** in Hollywood. Engineer **Bradley Cook** and engineer **Andrew Alekel** recorded the rage; **Offspring** vocalist **Dexter Holland** and comedy duo **Tenacious D** contributed vocals...At **Westlake Audio** (L.A.), **Quincy Jones** worked on his *Young Americans* project with engineer **Bob Brown** and assistant **Peter Kristensen** and **Donna Gay**...SinOMatic


Brad Stanfield and Colin Mitchell at Rumbo Recorders in Sherman Oaks, CA.

tracked their debut with producer/engineer **Eric Valentine** and assistant **Matt Lavella** at **Sound Image Studios** (Van Nuys). **Mr. Big** were also living large, working with producer/engineer **Pat Regan**...At **Skip Saylor Recording** (L.A.), assistant **Regula Merz** assisted on the tracking and mixing of **Tyrese**'s RCA project with producers **Chris Jennings** and **Eristopher** and engineer **Daniel Romero**...Mix engineer **Rob Chiarelli** mixed **Bosson**'s "Where You Are" track. **Jack Kugell** produced...Influential alt-country combo **The Jayhawks** flew into The Village in West L.A. to mix their sixth American Recordings CD, *Smile*. Producer **Bob Ezrin** and engineer **Jay Healey** were all grins...Fresh from his Grammy win for **Sting**'s *Brand New Day*, engineer **Neil Dorfsman** worked on tracks for New Age artist **Serah**'s CD at **Sound Design Recording** in Santa Barbara...Vocalist/guitarist **Brad Stanfield** (**Dave Mason**, **Jackson Browne**) holed up with engineer **Colin Mitchell** at **Rumbo Recorders** (Sherman Oaks) to produce tunes for **John Brown**'s Bobo Productions...

NORTHWEST

At **Private Radio** (Seattle), **Jack Endino** and former **MC5** guitarist **Wayne Kramer** produced a track by **Mudhoney**


The Jayhawks winged their way into The Village in West L.A. L to R: Guitarist/vocalist/songwriter Gary Louris, producer Bob Ezrin, bassist Marc Perlman and engineer Jay Healey.

for Internet label Musicblitz.com...Former Pavement member Steve Malkmus has started a new band called The Jicks, and they have been working at Supernatural Sound in Oregon City on their first release with engineer Jeff Saltzman...At Jackpot! (Portland), Larry Crane engineered a track for Versus' new Merge CD...At Bearcreek (Woodinville, WA), Blonde Redhead was coproduced by Ryan Hadlock...Peter Lawlor finished re-recording/mixing on a reissue project at Lion Dog Music (Seattle). Rick Ruskin engineered...Sean Lynch recorded Boy Crazy, Stereo Crush and Thebrotheregg at Resistor Studio (Portland)...Philip Steirs remixed The Spooks and Michael Rosen produced the Siren Six at Studio 880 in Oakland, CA...At Studio Blue (Seattle), Scot Charles and Len Delorey of Blue Charles Productions (Seattle) worked on the sound design for the PBS special *Born to the Wind*, which was scheduled to air June 23. Charles also completed sound design, editing and mix for the feature-length documentary *Unconquering the Last Frontier*, which chronicles the building of the dams on the Elwah River in Washington's Olympic Peninsula and its tragic consequences to the native people and the wildlife...At Studio D (Sausalito, CA), owner/engineer Joel Jaffe tracked and mixed a new project for Lost Weekend, a country swing combo featuring players from Merle Haggard's and Commander Cody's bands...Jason Begin engineered projects by Pedro Luz and the Prude Boys at Haywire in Portland...Rob Jackson and John Dammeier mixed a radio single for Fantastic Four at Cottonwood Recording Studio (Tacoma, WA)...At Master Works in Seattle, Barry Corliss mastered a compilation for Up/ Slabco featuring tracks by Modest Mouse, Mark Pickerel and others...Max Rose mastered projects by pianist David Barela, rapper OG Freeze, and the Virginia Coalition (which was mixed by Mitch Easter) at Disc Maker in Seattle...


Steve Malkmus

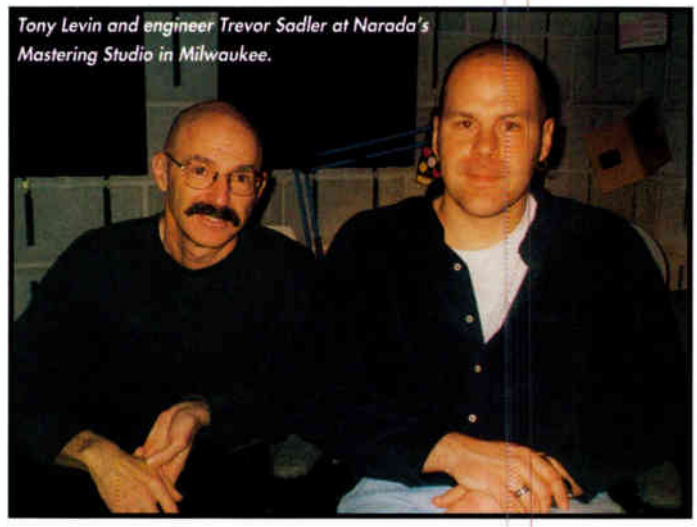
SOUTHWEST

Sweet: SugarHill Studios in Houston recently completed a total acoustical redesign of Studio A. The brainchild of VP Rodney Meyers, the room includes a custom-built oak Helmholtz resonator by local artisans at Meinkoth Millworks, a new 44-input Neotek Elite console and 5.1 surround monitoring. Since the renovations, engineers Dan Workman and Ramon Morales remixed a dance track for Enrique Iglesias. Morales recorded backup vocals for Beionce of Destiny's Child. Lyle Lovett recorded narration for a film. Clay Walker locked out Studio B. Then VH1 and Charter Films invaded and used the studio as a location for the movie *Exodus Live*, which focuses on a fictitious emerging band ...The folks at Airshow Mastering in Boulder, CO, were on the fly, mastering and restoring the fourth volume of the *Anthology of American Folk Music* for Smithsonian/Folkways. The two-CD set follows up a Grammy-winning 1997 three-volume set, culled from the Harry Smith Archive. David Glasser mastered. Airshow also assembled and mastered releases from the Frank and Ann Warner Collection of folk song recordings from Appalachia and North Carolina. The collectors' sons Jeff and Gerret Warner co-produced with the Appleseed label's Josh Michaell. Glasser and engineer Charlie Pilzer worked on the recordings at Airshow's Boulder and Springfield, VA, locations...Douglas Spotted Eagle began work on a film/video project on the life of Chief Washakie, last chief of the Shoshone nation, at Native Restoration (Stockton, UT)...At Arlyn Studios (Austin, TX), local band Vallejo toiled with producer Mike Barbiero...Wakeland woke up and tracked an album at Apple Valley Studio (Oklahoma City). Tech Brian Roth helped the boys outfit their vintage Otari 2-inch...Austin faves Omar and the Howlers recorded at Pedernales Studio (Austin, TX) with engineer Stuart Sullivan...Picki Music Productions (Las Vegas) recently released *World Soundtracks*, the first volume in a CD series of music in a variety of genres for film and TV...At Chaton Studios (Phoenix), Sam Moore of Sam and Dave did radio edits on a new spin-off of "I'm a Soul Man," produced by Billy Preston...


SugarHill Studios in Houston completed renovations on Studio A, with a Neotek Elite console.

NORTH CENTRAL

It's in the water: King Crimson bassist Tony Levin hung out in Milwaukee while his latest Narada CD, *Waters of Eden*, was mastered by engineer Trevor Sadler at the label's mastering studio...Lit got fired up, tracking vocals for an upcoming Java release at Airborne Audio near Kansas City, MO. Glen Ballard produced, and Don Miller engineered...Chicago Recording Co. in Chitown has been hopping: Nine Inch Nails, Goo Goo Dolls, Smashing Pumpkins, Kid Rock, the Freddy Jones Band, Violent Femmes and Collective Soul have been in...


Tony Levin and engineer Trevor Sadler at Narada's Mastering Studio in Milwaukee.

NORTHEAST

Meeting of the rock guitar titans at Showplace Studios (Dover, NJ): Eric Clapton and Keith Richards tracked with Hubert Sumlin, Howlin' Wolf's guitarist, for Sumlin's upcoming Mystic Music project. Levon Helm kept the beat, Rob Frabroni produced, and Ben Elliott engineered...At Sound On Sound (NYC), Ja Rule and Brandy tracked a Def Jam project produced by Top Dawg and engineered by Viala...Producer/engineer Pete Weiss kept busy in Boston: He co-produced folk/noir band Willard Grant Conspiracy's fourth Ryko/Slow River CD at Rear Window and Zippah Studio (both Brookline, MA). He also

recorded **The Wobblies** in Boston and NYC and finished former Scruffy the Cat frontman **Charlie Chesterman's** fourth solo CD at Zippah...Speaking of Zippah, the facility's engineer **Peter Weiss** recently engineered and co-produced **Magic 12**, tracked **Coronet Premiers**, and mixed **Seks Bomba**...**Paula Cole** went cowboy at a taping of *Live at the World Cafe* at **Indre Studios** (Philadelphia). She sang "Jolene" as well as songs from her latest, *Amen*, as **Tom Winch** and **Bogdan Hernik** handled the engineering. **Travis** also appeared at a *World Cafe* taping, and **Staind** banged out a short set for a 94 WYSP Rock Session...**Masterdisk's** former chief mastering engineer **Scott Hull** has a new mastering facility, **Classic Sound** (NYC), and it's teeming with projects. Recent projects include **Steely Dan's** latest and two tracks by **The Offspring**....**Adam Soskin** of **AKS Entertainment** plans to executive produce Pasha artists **Bring Um On** at **Axcess Left Studios** (NYC)...**Trutone** (Hackensack, NJ) engineers recently mastered hot dance tracks such as "Natural Blues" by **Moby** and "The Chase" by **Giorgio Moroder Vs. Jam & Spoon**...R&B artist **Phendi Moore** tracked his debut Hollywood CD at **City Sound Productions** (NYC) with producer **Rockwaller**, engineer **Corey Folta** and assistant **William Bowen**...Super soul at **Audiomaster** (Bethesda, MD): **James Brown** recorded narration for a *King of the Hill* episode, and **Christopher Reeve** did narration for Health Extra radio spots...

SOUTHEAST

Travis Tritt teamed up with producer **Billy Joe Walker Jr.** at **Sound Emporium** (Nashville) for his first project for Columbia. Principal engineer **Alan Schulman** was assisted by **Chris Stone**. (Other engineers include **Steve Tillisch** and **Matt Johnson**.) **David Thoener** plans to mix, and Hamstein Productions handled the production coordination for the October release...**Alison Krauss** made a stop at **Seventeen Grand Recording** (Nashville) to mix an *Austin City Limits* recording with engineer **Gary Paczosa**. **The Judds** were also in overdubbing and mixing their Mercury project with producer **Larry Strickland**, engineers **David Hall** and **Chuck Ainlay** and assistant engineers **Mark Hornsby** and **Bobby Morse**. **Take 6** did a 5.1 mix with producer/engineer **Jake Niceley**. **Beth Nielson Chapman** overdubbed and mixed with engineer Paczosa and assistant **James Bauer**...Taking a break from the tabloids, **Billy Bob Thornton** mixed

his upcoming recording at Recording Arts (Nashville)...Rubyhorse mixed an Interscope release with producer Jay Joyce, engineer Giles Reaves and assistant Kevin Szymanski at East Iris in Nashville...At Zone Recording Studio near Atlanta, producer/artist Rick Beato recorded Big Atomic, Left Front Tire, Lift, Jason Tillery and Rev 7 with help from engineer Billy Hume. Lil Jon and the Eastside Boyz were also in, finishing an album...Happenings at Chase Park Transduction in Athens, GA: Andy Baker worked with Jucifer for Capricorn, and Bob Weston got going on Some Soviet Station for Mood Swing...At Rock Quarry (Franklin, TN), producer/artist Dargi tracked, overdubbed and mixed a single by his band, Black on Black, with co-producer/engineer Gabriel Katona...At Doppler Studios (Atlanta), BBDO South and engineers Steve Schwartzberg and Fay Salvaras created and mixed sound design for a new TV and radio campaign for Bayer's plant insecticides featuring "Bobcat" Goldthwaite and Gilbert Gottfried. Producer Shek'spere worked on tracks for Kandi Burris (formerly of Xscape) at Doppler. Ralph Cacciurri engineered, and Steve Fisher assisted. Billionaire was also in, mixing a song from a Universal CD with producer/engineer Steve Haigler and assistant Cacciurri ...Japanese vocalist K recorded with former James Brown band members Bobby Byrd, Fred Wesley, John Starks and Clyde Stubblefield at Audioart Studio (Smyrna, GA). James Brown veteran engineer Bob Both handled the sessions...Suthern Click and Field Mob plan to record their MCA discs at Phoenix Recording (Macon, GA). OLE-E, Pop and Uncle Jamz will produce; Skip Slaughter will engineer...At Sound Stage (Nashville), Primal Gear recently hosted a demo and listening session for producers, engineers and studio owners such as Michael Wagener, Bill Whittington and Keith Thomas...Here's Mike: Veteran talk show host Mike Douglas recorded voice-over narration for a Lifetime TV special on Marie Osmond at Creative Music Recordings in Wellington, FL. Marilynn Seits and Sean McAusland engineered. Brothers Sean and Andy McAusland also engineered a live concert performance by trombonist Art Sayers and his Jazz Trombone Choir in Hobe Sound, FL...Sister Hazel recorded and mixed her Universal CD at Nickel and Dime Studios in Avondale Estates, GA. Hazel, Richie Zito and Paul Ebersold produced, with additional production and engineering by Don McCollister and assistant Cynthia...Rob Tavaglione produced a hardcore CD by Method 51 at Catalyst Recording (Charlotte, NC)...Starstruck Studios in Nashville hosted mix sessions for Tara MacLean with producer/engineer David Leonard and engineer Bryan McConkey...Bare Jr. (featuring guitarist/vocalist Bobby Bare Jr., son of the

L to R sitting: Billy Joe Walker Jr. and Travis Tritt at Sound Emporium in Nashville. Standing L to R: Ginny Johnson of Hamstein Productions and Gary Falcon of Falcon-Goodman Mangement.

crooner) recorded their sophomore album at **Dark Horse Studios** (Franklin, TN) with producer **Sean Slade** and engineer **Paul David Hager**...**The SoundShop** owner **Mike Bradley** debuted as a producer on **Aaron Tippin**'s album. **Biff Watson** co-produced...

STUDIO NEWS

Going animal at **Cello** (Hollywood): **Ed Cherney** and **Don Was** recently came up with the perfect present for the Divine Miss **Bette Midler**: leopard-painted KRK Exposé E7s. After the excitement over the monitors, Cherney and Was continued their mix of Midler's new album...**John Storyk** is designing a new studio for **Brian Keane Music Inc.** in Sandy Hook, Conn. The studio is owned by TV documentary composer/producer/guitarist **Brian Keane**...**Richard Oliver** designed a new sound lounge room for **Rob Sayers**, and designed **Flavor Units**' new three-room facility for **Shakim** and **Queen Latifah**...**5.1 Entertainment Group** in West L.A. recently installed a Soundtracs DPC-II digital production console... **Kappel and Kostow Architects** will design **Nickelodeon**'s new 33,000-square-foot digital animation studio in NYC...**Time Telepictures**, a division of Warner Bros., selected new AMS Neve Libra Live Series II consoles for two of its studios in its digital production facility in Burbank, CA...**NBC** will use Dolby E and Dolby Digital equipment for its Digital Television programming...**Pomann Sound** (NYC) installed one of the largest mSoft ServerSound systems in the city...**HBO Studio Productions** (NYC) chose an AMS Neve Libra Live Series II console for its new digital control room in Studio A...Producer/engineer **Greg "Slashcut" Schelander** was close to completing his new audio production and multimedia facility, **EchoVerb Music & Sound Design**, in the Minneapolis/St. Paul area...**Todd-AO Studios West** added Bag End subwoofer systems to its Santa Monica, CA, facilities...**Planet-3 Audio** (San Francisco) bought a Malcolm Toft Associates MTA 980 console...**Radio Spirits** in Chicago ordered four AudioCube 3-II mastering and restoration systems ...**Digi-Dog Studios** (Canoga Park, CA) chose an Otari Elite+ digitally controlled analog console...**City Sound Productions** (NYC) installed a mint Otari MTR-90 II analog 24-track recorder and purchased a Wurlitzer 200 electric piano...**Low-Key Digital Audio** (San Francisco) recently added a seven-bay duplicating tower with Teac drives to increase its CD-R duplication and printing capabilities. The company has already used the upgrade on projects for labels Ubiquity and Hearts of Space...**ARU Chicago** installed its third Fairlight Fame workstation. The facility's Studio 16 will also be updated with the latest samplers, sequencers and plug-ins...**Bella Voce** (Grass Lake, MI) now offers educational and training seminars on recording skills to musicians... **Frankie's Hideaway** (North Hollywood) opened in November 1999 as part of Bill's Place Sound Stages. Clients have included **Stone Temple Pilots, Bernie Taupin** and **Ice Cube**.

Checking out the monitors at Cello in Hollywood: foreground, Karen Brinton, director of marketing and promotion for KRK, and, rear L to R, Don Was, Al Sanderson, Jim Scott, Gary Meyerberg and Ed Cherney.

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e-mail: info@stepbridge.com
www.stepbridge.com

Stepbridge features SSL/Total Recall and Neve consoles, a beautiful Santa Fe-style recording environment with on-site accommodations. Recent clients include Herbie Mann, Smash Mouth, Tim Reynolds (Dave Mathews Band), Randy Travis and Dan Fogelberg, and we are delighted with Tim Stroh's grammy nomination for his work on Robbie Robertson's CD. Media clients include MTV, CNN, *Larry King Live*, VH1 and Kodak. Voice talents include Gene Hackman, Jim Lawless, Wes Studi and Val Kilmer. We now offer Pro Tools|24 and ISDN. Wonderful locale, great equipment and professional staff.

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For over 20 years, Artisan Recorders has been providing excellence in remote recording and broadcast. Along with an extensive array of equipment in a comfortable aesthetic environment, our "Mobile Red" studio boasts an expert staff of technicians with a love of music and a desire for perfection. Currently touring with ABC's *Tom Joyner Morning Show*. When you rock, we roll.

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Record Plant Remote has been an industry leader in location recording for over 20 years. We've kept abreast of new developments in audio technology without sacrificing our sonic integrity. Some of our recent clients include MTV, Aerosmith, Elton John, Michael Bolton, Spin Doctors, R.E.M., Live, Meatloaf, Wynton Marsalis, John Mellencamp, Keith Richards, Chuck Berry, Guns N' Roses, Whitney Houston, Pavarotti, INXS, James Taylor, Emmylou Harris, Shawn Colvin, Billy Ray Cyrus, Mary Chapin Carpenter, Trisha Yearwood and Harry Connick Jr. Our reputation speaks for itself!

▪ STUDIO SHOWCASE ▪

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Enjoy the relaxed, Midwest hospitality of BHS, a world-class analog recording studio created in a Gothic-style church. This unique studio features a 900-sq.-ft. kitchen, large recreation area with pool table, Ping-Pong, darts, TV, stereo and a separate private lounge for musicians. Features include a 160,000-cu.-ft. main studio, modified Neve 5106, MCI 2" 16-track, modified Ampex ATR-102 ½" 2-track, vintage tube mics, Hammond B-3, Steinway Concert Grand 9' model D, DVD 24/96 audio/video capabilities, complete production, in-house photography and design, and more.

OffPlanet Studios

608 Folsom St.
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Located in the SOMA district in San Francisco, OffPlanet combines state-of-the-art equipment and design.

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Dennis Drake's
Music Lab
Audio Mastering & Restoration

Dennis Drake's Music Lab

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e-mail: musiclab@ix.netcom.com

Located an hour south of NYC, the Music Lab is a full-service audio mastering facility using state-of-the-art Sonic Solutions mated with classic tube gear from Summit Audio, Ampex and Pultec. Chief engineer Dennis Drake specializes in back-catalog reissues and has mastered hundreds of CDs for Time-Life, Mercury, Verve and Brunswick, among others. Services also include archiving and mixdowns from 3- & 4-track analog masters.

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Record in South Beach, Miami. Strictly specializing in Pro Tools. Described in *EQ* mag as, "The best Pro Tools studio in the world." We transfer from 24-track 2", ADAT or Tascam DA-88/98 using the highest-quality Apogee AD8000 converters for the very best sound.

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Located in downtown Washington, D.C., Studio 4A offers a spectacular recording environment well-suited to all music genres. Studio 4A, at 2,600 sq. feet, is one of the largest recording facilities on the East Coast. We offer digital and analog multitrack recording, an extensive mic collection, digital editing suites and CD mastering. NPR also offers satellite uplinking, fiber-optic and ISDN capabilities worldwide.

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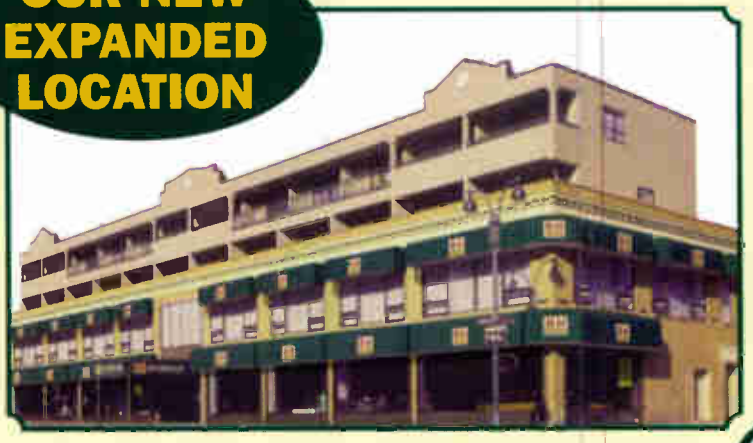

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HARD DISK RECORDING

digidesign AVID
A Division of Avid Technology, Inc

DIGI001 Digital Audio Workstation For Mac And PC

A completely integrated digital recording, mixing and editing environment for the Mac and PC, the DIGI-001 offers a 24-bit multi I/O breakout interface along with Pro Tools LE software— based on Digidesign's world renowned ProTools software. The DIGI-001 interface features 18 simultaneous I/Os made up of 8 analog inputs and outputs— two of the inputs are full featured mic preamps with phantom power, and digital I/O including standard S/PDIF as well as an ADAT optical interface that can also be used as a S/PDIF I/O. ProTools LE supports 24 tracks of 16 or 24-bit audio and 128 MIDI tracks and also features RealTime AudioSuite (RTAS) effects plug-ins. For ease of use, MIDI and audio are editable within the same environment and all mixing parameters including effects processing can be fully automated.

FEATURES–

- 18 simultaneous, 24-bit ins and outs with support for 44.1 and 48 kHz sample rates
- 20Hz - 22kHz freq. response ± 0.5 dB
- 2 channel, XLR mic/1/4" line inputs with -26 dB pad, 48v phantom power, gain knob, and HP Filter at 60Hz
- 6 ch. line inputs (1/4") TRS balanced/ unbalanced w/ software controlled gain
- +4dB balanced 1/4-inch Main outputs
- Balanced 1/4" monitor outs with front panel gain knob
- 1/4-inch unbalanced line outputs channels 3-8
- Headphone output with independent gain control knob
- 2 channel S/PDIF coaxial digital I/O
- 8 channel ADAT optical I/O can also be used as 2 channel optical S/PDIF

Pro Tools LE

- Supports 24 tracks of 16 or 24-bit audio and 128 sequenced MIDI tracks
- Sample-accurate simultaneous editing of audio & MIDI
- Real-time digital mixing capabilities include recall of all mixing parameters, support for edit and mix groups and complete automation of all volume, panning, mutes and plug-ins.
- Route and mix outboard gear in realtime
- MP3 and RealAudio G2 file support (Mac)
- Two plug-in platforms offer multiple options for effects processing— Real-Time AudioSuite (RTAS) is a host-based architecture that allows an effect to change and be dynamically automated in realtime as the audio plays back. —AudioSuite is a file-based format, that renders a new file with the processed sound.
- Bundled RTAS plug-ins include, 1 and 4-band EQ, Dynamics II- compressor, limiter, gate and expander/gate, Mod Delay - short, slap, medium, and long delays with modulation capabilities for chorus or flange effects and dither. AudioSuite plug-ins include Time Compression/Expansion, Pitch Shift, Normalize, Reverse.

MIDI Functions

- MIDI functions include graphic controller editing, piano roll display, up to 128 MIDI tracks and editing options like quantization, transpose, split notes, change velocity and change duration.
- MIDI data can be edited on the fly

MOTU AUDIO Hard Disk Recording Systems

The MOTU Audio System is a PCI based hard recording solution for the Mac and PC platforms. At the heart of the system is the PCI-324 PCI card that can connect up to three audio interfaces and allows up to 72 channels of simultaneous I/O. Audio interfaces are available with a wide range of I/O configurations including multiple analog I/O with the latest 24-bit A/D/A converters and/or multi channel digital I/O such as ADAT optical and TDIF I/O as well as standard S/PDIF and AES/EBU I/O. Each interface can be purchased separately or with a PCI-324 card allowing you to build a system to suit your needs. Includes drivers for all of today's hottest audio software and AudioDesk, multitrack recording and editing software for the Mac.

THEY ALL FEATURE–

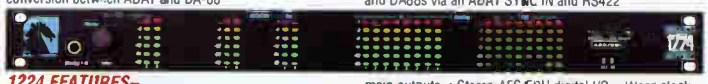
- Mac OS and Windows compatible • Includes software drivers for compatibility with all of today's popular audio software plus AudioDesk, MOTU's sample-accurate audio workstation software for Mac OS • Host computer determines the number of tracks that the software can record and play simultaneously, as well as the amount of real-time effects processing it can support • Front panels display metering for all inputs and outputs
- **AudioDesk Audio Workstation Software** for Mac OS features 24-bit recording, multi-channel waveform editing, automated virtual mixing, graphic editing of ramp automation, real-time effects plug-ins with 32-bit floating point processing, crossfades, support for third-party audio plug-ins (in the MOTU Audio System and Adobe Premiere formats), background processing of file-based operations, sample-accurate editing and placement of audio, and more

1296 24 bit/96kHz Interface Features–

- 24-bit, enhanced multi-bit 128x oversampling 96kHz converters • A-weighted signal-to-noise ratio of 117 dB • 12 Balanced XLR inputs and outputs can support two simultaneous 5.1 mixes • AES/EBU I/O with sample rate conversion both in and out • Compatible with existing PCI-324 cards (requires new PCI-324 driver)• Connect up to 3 1296 interfaces to one PCI-324 card for a total of 36 inputs and outputs or mix and match the 1296 interface with up to three of the other MOTU audio interfaces

2408 mkII FEATURES–

- 7 banks of 8 channel I/O: 1 bank of analog, 3 banks of ADAT optical, 3 banks of Tascam TDIF, plus stereo S/PDIF. • Custom VLSI chip for amazing I/O capabilities • • Format conversion between ADAT and DA-88
- 8x 24-bit 1/4" balanced analog I/Os • 24-bit internal data bus for full 24-bit recording via digital inputs • Standard S/PDIF I/O for digital plus an additional S/PDIF I/O for the main mix • Sample-accurate synchronization with ADATs and DA88s via an ADAT SYNC IN and RS422



1224 FEATURES–

- 24-bit analog audio interface • State-of-the-art 24-bit A/D/A • Simultaneously record and play back 8 channels of balanced (TRS), +4 dB audio • 24-bit balanced +4 XLR main outputs • Stereo AES/EBU digital I/O • Word clock in/out • Dynamic range of 118 dB (A-weighted) • Front panel displays six-segment metering for all inputs and outputs • Headphone jack with volume knob

CD RECORDING/MASTERING

ALESIS Masterlink ML-9600 High-Resolution Master Disk Recorder

The Alesis MasterLink ML-9600 is a 2-track 24-bit recorder that combines hard disk recording, CD burning, digital signal processing, and mastering functions to create compact discs in the standard "Red Book" 16-bit/44.1kHz format, or high resolution CDs that utilize Alesis' revolutionary CD24 AIFF-compatible technology. MasterLink is capable of recording and playing up to 24-bit/96kHz resolution CDs using the inexpensive, readily available CD-R media. The amazing sonic quality, powerful built-in tools and CD24 technology offers a uniquely versatile and affordable solution for everyone from large commercial audio facilities to project studios and recording musicians.

FEATURES–

- 24-bit 128x oversampling analog to digital and digital to analog converters
- Supports 44.1, 48, 88.2, 96 kHz sample rates and word lengths of 16-, 20- and 24-bit
- 20Hz-20kHz frequency response at 44.1/48 kHz sample rates
- 20Hz-40kHz, frequency response at 88.2/96 kHz sample rates
- 113dB signal-to-noise ratio (A-weighted)
- Matsushita ATAPI CD-ROM drive allows up to 4x CD burning using standard CD-R discs.
- Built-in sample rate conversion & noise shaping to change sample rates & bit resolution as needed
- Reads and Writes 16-bit 44.1kHz Red Book Audio CDs
- Alesis' exclusive CD24 is a high-resolution mastering format that reads/writes files up to 24-bit 96kHz in the ISO 9660 disc format. AIFF compatible file format that can be read by MacOS, Windows and Unix computer platforms.
- Built-in 3.2GB IDE hard drive
- Hard disk max recording times 95 min. @ 24-bit/96kHz 310 min. @ 16-bit/44.1kHz
- Create and store up to 16 playlists containing as many as 99 tracks

Analog Inputs and Outputs

- Balanced XLR connectors (-4dBu input and +19dBu max. output)
- Unbalanced phono (RCA) connectors (-10dBV input and +5dBV max. output)
- 1/4-inch TRS headphone output with level control

Digital Inputs and Outputs

- AES/EBU balanced XLR inputs and outputs
- S/PDIF unbalanced phono (RCA) inputs and outputs

Editing

- Gain control
- Cropping allows adjusting start and end points.
- Join and Split features allow combining and separating song sections.

DSP Finishing Tools

- Equalization, Compression, Normalizing and Peak Limiting

Includes

- Infra red remote control and rackmount brackets

marantz CDR-631 Professional CD Recorder

The CDR631 offer all the features and functions of the CDR630, its popular predecessor but adds many features and functions that were previously unavailable. Its full complement of digital and analog connections lets you record your own CDs from audio sources such as CDs, LPs, cassettes, DAT, or even a computer.

Features–

- Pro and consumer CD-R and CD-RW compatible
- Track titles can be saved and edited in CD-TEXT format that can be read on CD-TEXT compatible CD players
- Memory buffer that prevents the beginning of tracks from getting cut-off
- Menu selectable SCMS copy protection
- Digital and analog record level and balance control
- XLR-Balanced and RCA unbalanced analog inputs
- AES/EBU (XLR), Coaxial, and Optical digital inputs
- Unbalanced (RCA) analog and Coaxial digital outputs including Coaxial loop-out for unprocessed connection to other digital equipment
- IR remote control included

MICROBOARDS StartREC Digital Audio Editing/ CD Duplication System

The Microboards StartREC is the first digital audio editing system combined with a multidrive CD recordable duplication system for professionals. Audio is recorded to the internal 6.2 GB IDE hard drive using analog or digital inputs. Sample rate conversion is automatic. Tracks can be edited and sequenced using the StartREC's user friendly interface and up to 4 CDs can be recorded simultaneously. StartREC is the ideal solution for studio recording, mastering, post production or any pro audio environment requiring digital audio editing and short run CD-R duplication.

Features–

- 2X, 4X, or 8X recording speeds
- 6.2GB IDE hard drive
- Editing functions include move, divide, combine or delete audio tracks, add or drop any index or sub index, and create track fade in or fade out
- Coaxial SP/DIF or AES/EBU digital input plus optical S/PDIF I/O
- XLR balanced and RCA Line inputs and outputs
- Automatic sample rate conversion from 32 and 48kHz
- Automatic CD Format Detection feature and user friendly interface provide one touch button operation
- Front panel trim pot and LCD display provide accurate input signal and time lapse metering
- SCMS (Serial Copy Management System) is supported, regardless of the source disc copy protection status
- **StartREC Models Include:** ST2000 (2) 8x writers, ST3000 (3) 8x writers and ST4000 (4) 8x writers

DIGITAL MULTI-TRACK RECORDERS

TASCAM MX-2424 24-Bit 24-Track Hard Disk Recorder

Co-designed by TASCAM and TimeLine Inc., the MX-2424 is an affordable 24-bit, 24-track hard disk recorder that also has the editing power of a digital audio workstation. A 9GB internal hard drive comes standard as well as a SCSI Wide port that supports external LVD (Low Voltage Drives) hard drives from up to 40 feet away. An optional analog and several digital I/O cards are available so the MX-2424 can be configured to suit your work environment. SMPTE synchronization, Word Clock, MIDI Time Code and MIDI Machine Control are all built in for seamless integration into any studio.

- Records 24 tracks of 24-bit audio at 44.1 or 48 kHz, or 12 tracks at 88.2 or 96 kHz. Up to 24 tracks can be recorded simultaneously using any combination of digital and analog I/O.
- Supplied 9GB internal drive allows 45 minutes of audio across all 24 tracks
- Wide SCSI port on the back panel allows you to add multiple drives. A front 5-1/2" bay available for installing an additional drive, or an approved DVD-RAM drive for back-up.
- ViewNet MX, a Java-based software suite for Mac and PC offers DAW style editing of audio regions, dedicated system set-up screens that make set-up quicker and easier and track load screens that make virtual track management a snap. Connects to a computer via a standard Ethernet line.
- Can record to Mac (SDII) or PC (.WAV) formatted drives, allowing later export to the computer. The Open TL format allows compatible software to recognize virtual tracks without have to load, reposition and trim each digital file.

Transport Controls-
- Jog/scrub wheel
- MIDI In, Out, and Thru ports are built-in for MIDI Machine Control.

Editing-
- Built-in editing capabilities include cut, copy, paste, split and ripple or overwrite
- 100 levels of undo
- Supports destructive loop recording and non-destructive loop recording which continuously records new takes without erasing the previous version.

Build-In Synchronization-
- TBUS protocol can sample accurately lock 32 machines together for 384 tracks at 96kHz, or 768 tracks at 48kHz.
- Can generate or chase SMPTE timecode or MIDI Time Code.
- Word Clock In, Out, and Thru ports

I/O Options-
- Optional analog and digital cards all provide 24 channels of I/O. There is one slot for analog and one for digital.
- IF-TD24- T/DIF module
- IF-AD24- ADAT Lightpipe module
- IF-AE24- AES/EBU module
- IF- AN24- A-D, D-A I/O module with DB-25 connectors

Software Updates-
- System updates are made available through a front panel Smart Card slot or via computer directly from the TASCAM web site.

DA-78HR Modular Digital Multitrack

The DA-78HR is the first true 24-bit tape-based 8-track modular digital multitrack recorder. Based on the DTRS (Digital Tape Recording System) it provides up to 108 minutes of pristine 24-bit or 16-bit digital audio on a single 120 Hi-8 video tape. Designed for project and commercial recording studios as well as video post and field production, the DA-78HR offers a host of standard features including built-in SMPTE Time Code Reader/Generator, MIDI Time Code synchronization and a digital mixer with pan and level controls. A coaxial S/PDIF digital I/O allows pre-mixed digital bouncing within a single unit, or externally to another recorder or even a DAT or CD recorder. Up to 16 DTRS machines can be synchronized together for simultaneous, sample accurate control of 128 tracks of digital audio.

Features-
- Selectable 16 bit or 24 bit High Resolution audio
- 24 bit A/D and D/A converters
- >104dB Dynamic range
- 20Hz - 20kHz frequency response ±.5dB
- 1 hr. 48 min. recording time on a single 120 tape
- On-Board SMPTE synchronizer - chase or generate timecode
- On-Board support for MIDI Machine Control
- Internal digital mixer with level and pan for internal bouncing, or for quick mixes
- Track slip from -200 to +7200 samples
- Expandable up to 128 tracks (16 machines)
- Word Sync In/Out/Thru
- Analog output on DB25 balanced or RCA unbalanced
- Digital output on TDIF or 2 channels of S/PDIF

A TO D CONVERTERS

APOGEE Rosetta 24-bit A to D Converter

The high-end quality analog to digital solution for the project studio. With support for both professional and consumer digital formats you can now record your audio at a higher resolution and with greater detail than standard converters found on MDM's, DAT's and DAW's. Ideal for mastering or tracking.

FEATURES–
- 24-bit, 44.1-48, 88.2-96 kHz Sample Rate (±10%)
- 116dB dynamic range (unweighted)
- Improved UV22HR for 16 and 20-bit A/D conversion

FRONT PANEL:
- Power switch • Sample Rate (44.1, 48, 88.2, 96kHZ)selector • 16-bit (UV22), 20-bit (UV22) and 24-bit resolution selector • S/PDIF-ADAT optical selector • Soft Limit on or off • 12-segment metering w/ over ondicator & Meter Clear switch • Level trim

REAR PANEL:
- XLR balanced inputs • 2 x AES/EBU for 88.2/96kHz 2 channel path, Coaxial S/PDIF, switchable S/PDIF or ADAT optical outputs • Wordclock out

LUCID AD 9624 24-bit A to D Converter

Transparent analog to digital conversion designed to bring your music to the next level. XLR balanced inputs feed true 24-bit converters for revealing all the detail of the analog source. 16-bit masters can take advantage of the AD9624's noise shaping function which enhances clarity of low level signals.

FEATURES–
- 24-bit precision A/D conversion • Support for 32, 44.1, 48, 88.2 & 96kHz sample rates • Wordclock sync input• Selectable 16-bit noise shaping • Simultaneous AES/EBU, coaxial and optical S/PDIF outputs • 20-segment LED meters w/ peak hold & clip indicators • **ALSO AVAILABLE:** DA9624 24-bit D/A converter

DIGITAL MIXERS

Roland VM Basic 72 Digital Mixing System

The all digital Roland V-Mixing System, when fully expanded, is capable of mixing up to 94 channels with 16 stereo (32 mono) onboard multi-effects including COSM Speaker Modeling. Utilizing a separate-component design, comprised of the VM-C7200 console and VM-7200 rackmount processor, allows the V-Mixing System to be configured to suit your needs. Navigation is made easy via a friendly user interface, FlexBus and EZ routing capabilities as well as a large informative LCD and ultra-fast short cut keys.

- 94 channels of digital automated mixing (fully expanded)
- Up to 48 channels of ADAT/Tascam T-DIF digital audio I/O with optional expansion boards and interfaces
- Separate console/processor design
- Quiet motorized faders, transport controls, total recall of all parameters including input gain, onboard mixer dynamic automation and scene memory
- 24 fader groups, dual-channel delays, 4-band parametric channel EQ + channel HPF
- FlexBus and "virtual patchbay" for unparalleled routing flexibility
- Up to 16 stereo (or 32 mono) multi-effects processors using optional VS8F-2 Effects Expansion Boards (2 stereo effects processors standard)
- COSM Speaker Modeling and Mic Simulation technology
- 5.1 Surround mixing capabilities
- EZ Routing allows mixer settings to be saved as templates
- Realtime Spectrum Analyzer checks room acoustics in conjunction with noise generator and oscillator
- Digital cables between processor and mixer can be up to 100 meters long- ideal for live sound reinforcement.

- **VS8F-2 Effects Expansion Board** -- Provides 2 stereo effects processors including COSM Speaker Modeling. Up to 3 additional boards can be user-installed into the VM-7200 processor, for 8 stereo or 16 mono effects per processor.
- **VM-24E I/O Expansion Board** -- Offers 3 R-Bus I/Os on a single board. Each R-Bus I/O provides 8-in/8-out 24-bit digital I/O, totalling 24 I/O per expansion board.
- **DIF-AT Interface Box for ADAT/Tascam** -- Converts signals between R-Bus (VM-24E expansion board required) and ADAT/Tascam T-DIF. Handles 8-in/8-out digital audio. 1/3 rackmount size.
- **VM-24C Cascade Kit** -- Connects two VM-Series processor units. Using two VM-7200 processors cascaded and fully expanded with R-Bus I/O, 94 channels of audio processing are available.

EFFECTS & PROCESSING

Lexicon MPX-500 24-Bit Dual Channel Effects Processor

The MPX 500 is a true stereo 24-bit dual-channel processor and like the MPX100 is powered by Lexicon's proprietary Lexichip and offers dual-channel processing. However, the MPX 500 offers even greater control over effects parameters, has digital inputs and outputs as well as a large graphics display.

- 240 presets with classic, true stereo reverb programs as well as Tremolo, Rotary, Chorus, Flange, Pitch, Detune, 5.5 second Delay and Echo
- Balanced analog and S/PDIF digital I/O
- 4 dedicated front panel knobs allow adjustment of effect parameters. Easy Learn mode allows MIDI patching of front panel controls.
- Tempo-controlled delays lock to Tap or MIDI clock

t.c. electronic M-One Dual Effects Processor

The M-One allows two reverbs or other effects to be run simultaneously, without compromising sound quality. The intuitive yet sophisticated interface gives you instant control of all vital parameters and allows you to create awesome effects programs quickly and easily.

- 20 incredible TC effects including, Reverb, Chorus, Tremolo, Pitch, Delay and Dynamics
- Analog-style user interface
- 100 Factory/100 User presets
- Dual-Engine design
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

D-Two Multitap Rhythm Delay

Based on the Classic TC2290 Delay, the D-Two is the first unit that allows rhythm patterns to be tapped in directly or quantized to a specific tempo and subdivision.

- Multitap Rhythm Delay
- Absolute Repeat Control
- Up to 10 seconds of Delay
- 50 Factory/100 User presets
- 24 bit A/D-D/A converters
- S/PDIF digital I/O, 44.1-48kHz
- Balanced 1/4" Jacks - Dual I/O
- 24 bit internal processing

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—FROM PAGE 68, SCORING "THE PATRIOT"

ues. "I think that most people would say that this room is the nicest compromise of volume to reverb time to liveness to control that we have."

Murphy set up the large orchestra ("in the neighborhood of 95 players") in a standard configuration, with Williams' podium in front of the control room window, facing the projection screen. At Williams' request, the studio provided orchestra risers for the rear row of celli and basses, improving sight lines to the podium and increasing proximity to the room mics. "It gets a bit of air under the instrument and adds some resonance," Murphy says.

As primary sources for his 5-channel stereo mix, Murphy used the familiar Decca Tree microphone setup with "spreaders." Three omnidirectional Neumann M50s suspended about 10 feet above the conductor's position were flanked by a pair of Schoeps 222s with MK21 capsules, each situated about 15 feet wide of center. These primary mics were fed direct to the multitracks, augmented as necessary by a variety of spot and section mics, some of which were used only for reverb sends. Two omni mics located high in the corners of the room provided an overall orchestra ambience, which Murphy routed to the stereo surround channels.

Murphy's reverb setup included five channels of Lexicon 480 dedicated to the front channels, though returns were also routed to the surrounds at lower levels. As Murphy describes it, the orchestra presence in the surrounds is intended to be supportive. "It's not meant to call attention to itself—you wouldn't notice it unless it was shut off," he notes. As Murphy pointed out, the use of the surrounds in film scoring is restrained in comparison to 5.1 mixing for record, which usually assumes five comparable monitor speakers. "[In film], we use rolled-off surrounds, and we don't tend to put anything in the surrounds except distance mics or ambient material, unless there's a specific reason to," he explains. "Very occasionally there'll be an effect we want to sweep around into the surrounds—there'll be an instrument we want to put specifically in back. But that's not common, that doesn't happen very often."

PHOTO: ELIZABETH ANNAS © 2000

The scoring team at Sony Pictures Scoring Stage. Back row, L to R: Pat Weber, engineer; Shawn Murphy, scoring mixer; Mark Eshelman, stage manager and Pete Doell, recordist. Front row: Sue McLean, recordist, and Grant Schmidt, assistant stage manager.

LIVE MIXES AUTOMATED

The Sony scoring stage console is a 72-input Neve VR dating from about 1997. "Prior to that they had a modified 8128, vintage 1984," Murphy says. "That was only a 56-input console, so the 72-input has helped, though we often bring a Martech sidecar in, which expands this board to 96 inputs. That's probably the number that a scoring stage needs to have nowadays." For *The Patriot* sessions, Murphy used about 54 inputs; Sony also provided a DDA monitor console that stage manager Mark Eshelman used to create headphone mixes for conductor, soloists and section leaders.

Murphy used the Neve's onboard Flying Faders automation on every take. "I like this automation, and it's unfortunate that, since Neve and Martinsound have parted ways, this automation doesn't come with Neve consoles anymore," he comments. Murphy used the Neve's preamps for solo and section mics, but routed the seven primary distant mics straight to tape via outboard preamps. The Decca Tree and wide-arrayed Schoeps mics were run through EAR tube preamps, while spot and solo mics were patched into Grace, Boulder and Avalon preamps; all were then multed to the Neve for the live 7.1 and 2-track mixes. Murphy's use of EQ was minimal: he used five channels of Avalon 2055 EQ on the five front mix buses (approximately +2 at 15 Hz, -1 at 400 Hz, +2 at 25 kHz) and dialed in console EQ on only three channels.

MONITORING

Murphy monitored the LCR mix through his three Wilson Audio WATT VI monitors, an evolution from the WATT I systems he began using in 1987. "In the SDDS matrix, the LE and RE signals are assigned 75/25 to left/center and right/center in the 5.1 crashdown," he explains. "The monitor panel in the VR desk does not have this capability, so I merely superimposed the LE and RE signals on the left and right monitor channels." Powered by Krell KSA-250 amplifiers through Transparent Audio Cables, the Wilsons were supplemented by Sunfire subwoofers for the LFE channel (generally referred to as "boom"), which had been aligned to 91 dBC. As Murphy notes, "the 0.1 channel is rarely calibrated, so you never really know how it's going to sound in the theater." The stereo surround mix was distributed through JBL bipole speakers mounted high on the side walls of the relatively large control room, but as Murphy had predicted, it was hard to hear if they were on.

Scoring *The Patriot* took about two weeks, with 13 three-hour sessions scheduled for recording the score and a further two for source music. Throughout the afternoon session that *Mix* attended, Williams and Murphy repeated much the same process for each cue. After some rehearsal, during which Murphy perfected balances and any necessary fader moves, all four analog tape machines were put into record. As soon as Murphy felt he had a representative performance on tape, Williams and Murphy listened to playback, discussed musical or engineering adjustments, and re-recorded each cue until satisfied.

Working with a conductor who decides on a master "then and there" is unusual, notes Murphy. "It's unusual in terms of being that definite about what you want and having an orchestration that's that complete. I've always thought that if you can avoid the generation loss, if you can avoid the technical elements of remixing and just do it live, that's the best."

Having worked together on scores for about 18 pictures and almost as many album projects, Murphy and Williams are a comfortable and efficient studio team. At the end of the session, as players left the studio and the crowded control room emptied, Williams and Murphy prepared for a playback session to decide or confirm each cue's master take. Selected 7.1 master takes were then loaded into a Sonic Solutions system, ready for Ken Wannberg to take to the final mix at the Cary Grant Theatre. ■

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—FROM PAGE 34, CARNEGIE HALL

but we convinced him that that was just too risky.

The group had had only one rehearsal—the day before in a different hall—and this was going to be their only chance to run down the piece with the Disklaviers and the full sound system. I had to admit I had trepidations. At school, we had put four months of rehearsal into it, while these folks were going to do it in two days. But I knew from the first downbeat that it was going to be fine. Percussionists are a class of players I have always admired for their skill in navigating seemingly impossible scores, and these cats were among the best New York had to offer. They were *good*, and so was the conductor, Dennis Russell Davies, who threaded his way through the more than 600 time-signature changes without hesitation.

The only glitch was that Davies couldn't hear the click track, which was the only way the Disklaviers and the players were going to be able to stay together. I had specified a Shure wireless in-ear monitor system (we used one at my school, and it worked great), but the orchestra had gotten something else—and it just wasn't loud enough. No matter how we gain-staged the inputs and outputs, the thing would go into hard clipping whenever we got anywhere near a usable level. So we got rid of it, and the crew quickly ran a cable from the Mackie 1202 mixer handling the click (which itself was coming from an isolated output on the Kurzweil), across the stage to a single headphone for Davies to wear. Now he had plenty of volume.

Two run-throughs later, the ensemble had the piece up to the tempo they wanted, while I jumped on and off the stage and ran around the hall checking the propeller levels, and signaling tweaks to the sound crew. It went like clockwork, and everyone was happy.

And this is where the story should end, with a line like, "The performance was great, all our preparation paid off, the audience loved it, and we got a rave review in the *New York Times*." But it didn't quite turn out that way.

The preconcert panel I was speaking on started at 1:30, 90 minutes before show time. A table with four mics was set up on stage, and the main house system (the side stacks) was turned on. We panelists talked and answered questions for about 45 minutes, and then final preparations for the concert began. Miles and I asked if we could do a soundcheck, and the orchestra management said no: Since the house was open, too many people would hear the noises, and they wanted to "surprise" them. So Miles walked around the stage doing an "idiot check," making sure none of the MIDI cables were pulled out or splitter switches inadvertently thrown, and I double-checked the MIDI-to-bells hookup and listened to the click track.

The house lights went down, conductor Davies took the stage, put on his cans, nodded to Miles, and we were off. After about 30 seconds, Miles and I looked at each other: Where the hell were the propellers? We waited for another place where the propellers came in, watching the score closely, and sure enough, no propellers. Fortunately, the table that had been set up for us was right near the exit door, and so, as nonchalantly as I could, I got up from my seat, left the stage, and announced to the crew that the propellers were not coming through the sound system. All hell broke loose backstage, so I, still nonchalantly, closed the door and walked back to my seat. After about a minute, the door opened a crack, so I got up again, and a sheepish crew member told me what had happened: During the preconcert panel, one of the crew had powered down the monitor system and then forgot to bring it back up again.

If you're doing a high-profile live performance, don't use the very latest technology, or even Revision x.0 of *anything*. Go back a generation or two and use tried-and-true stuff.

Would it be okay, I was asked, if an electrician were to walk across the stage, while the performance was going on, to where the power amps were, and turn them on? No problem, I said. Cool as a cucumber, the electrician did exactly that, and at the next propeller cue, all was well. All the audience knew was that something had to be adjusted onstage. The piece finished in grand style, the audience did love it, and we did get a very positive review in the *Times*.

At a reception after the concert, I asked Davies if he knew the propellers were missing at the beginning. No, he said, he was too busy conducting the live musicians. But toward the end of the piece, there are long sections in which the propellers sound by themselves, and had they remained turned off for the entire performance, there would have been huge inexplicable holes. Since I had the power to stop the performance by stopping the sequencer, I asked him if, in the event we couldn't fix the propellers right away and I had stopped the piece, would he have had me shot. He replied, "No, that would have been the right thing to do." He then told me a story of a piece he was conducting in Europe that starts with the entire orchestra playing an F major chord, only one of the violinists played an F sharp. He stopped the piece, turned to the audience, and said, "We can do better than that." And they did. A class act, to be sure.

So there are a few lessons to be learned here. One, if you're doing a high-profile live performance, don't use the very latest technology, or even Revision x.0 of *anything*. Go back a generation or two and use tried-and-true stuff. If you *have* to use brand-new tools, try to get some inside contacts with the company that makes them, so you can get problems fixed fast. Two, try everything out way ahead of time, in a situation as close to the real performance as possible, to give you room to maneuver in case things don't work the way they're supposed to. The interface problems that we were able to solve very nicely would have been fatal had we discovered them the day before the show. Three, even the best, most experienced people make mistakes. And four, which is a direct corollary to three, whenever you have the opportunity to check your equipment just before a gig, take it. And then check it again. Because even when you make it to Carnegie Hall, you still have to practice. ■

Paul D. Lehrman is a composer, author and MIDI freak (still) and editorial director of Mix Online (*www.mixonline.com*). *You can find out more about the* Ballet Mécanique (*and read the reviews*) *at www.antheil.org.*

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Electronic Musician 2000 EDITORS CHOICE

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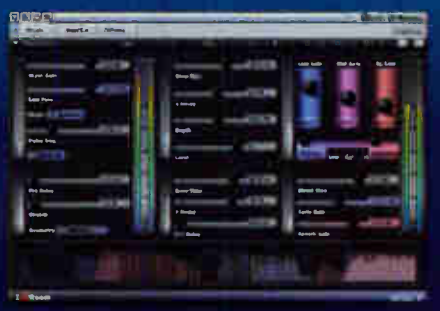

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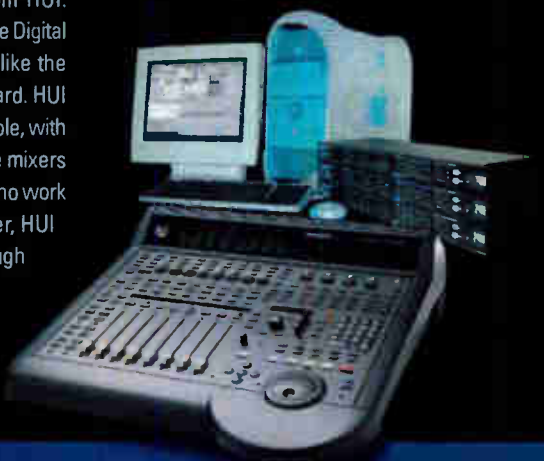

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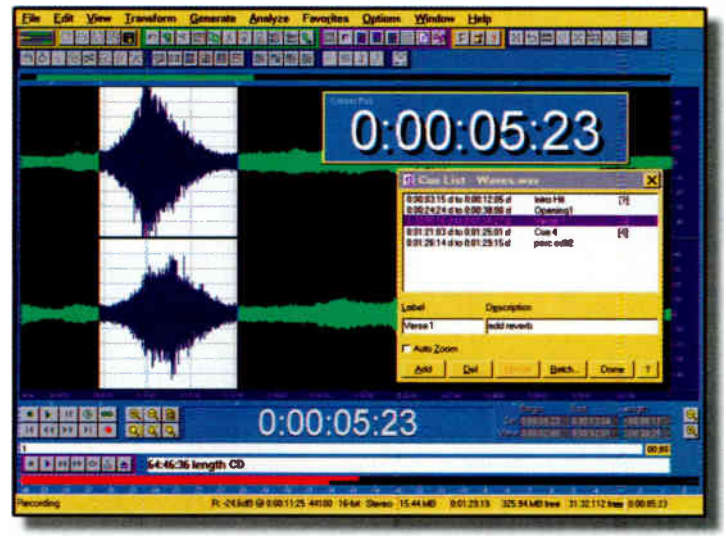
SYNTRILLIUM COOL EDIT PRO

DIGITAL AUDIO EDITING SOFTWARE FOR THE PC

Whenever I run into a piece of software or hardware that's powerful, easy to use and cost-effective, I become a walking, talking billboard. Such is the case with Syntrillium Software's Cool Edit Pro. This integrated stereo and multitrack (up to 64 stereo tracks) audio editor for the PC is one of the most straightforward, feature-laden Swiss Army knives that I have had the pleasure to use.



Cool Edit Pro's edit screen is straightforward and uncluttered.

FAVE RAVES

The top of my "faves" list in CEP is its ease and speed in defining regions and navigating around in the 2-channel or multichannel waveform views. Defining a region is done by left-clicking and dragging the playbar cursor to the desired position. Right-clicking on a region's start or end boundaries lets you move the in/out points to a new location. Clicking on a Zoom icon lets you zoom in or out, view an entire file, view just the defined region, or jump to the region's start/end boundary points. Clicking again on either the start or end boundary icon will continue to zoom into that location, letting you trim edits with amazing speed and accuracy.

In addition to handling DirectX plug-ins, CEP includes more than 40 native effects for a wide range of processing/mastering needs. My personal picks include a graphic-based dynamics processor that actually lets you click and draw any amplitude curve you want. But I like experimenting with extreme settings that affect the frequency balance in cool ways that seem to defy logic.

FORMATS!

For those of you who work in multimedia, CEP can read and write 23 different sound file formats (including Apple's .AIFF and RealNetworks' G2). Beyond .WAV files, I'm most impressed with the 24th format that can be bought from Syntrillium for $29: MP3.

I use the program's Timed Record feature to automatically record my favorite radio program on Saturday nights. When I get home, I simply edit out the news, encode the MP3 in mono 40 kb/s (that's how the music sounded in the '30s and '40s, anyway) and can store 32 hours of music on a CD-R, which would make CEP great for broadcast logging or storing airchecks.

LOOPS, LOOPS, LOOPS...

One of the best ways to find a loop's in/out points is the Find Beats function. Manually place the play cursor at a point just before the loop's start point. Then, using the Find Beat Right from the Edit menu, press Play, and 95% of the time the cursor will have jumped to the beginning of the loop. If you've caught an earlier beat, just use Find Beat again. To catch your end point, right-click on the play cursor, drag the region to a point just before the loop's end, then select Find Beat either to the left or right until you're on it. Then, press the Play Loop button and you'll be amazed! It's uncanny how accurate this feature is at grabbing good, clean loop points.

Another helpful tip for defining loops that were recorded from a single source (or those having the same timing reference) is to set the time display readout to samples, instead of time. This works great when I record the various instrument parts from a groove machine into CEP. After defining the first loop and saving it to a directory, I copy the total number of samples (from the time display's sample length window) into the Windows clipboard (Ctrl-C). To make all of the loop times match, simply locate the in point for each loop and paste the number of samples back into the sample length window. The region out point will automatically jump to its proper length, every time. Because all the loops are equal, you can easily drop the various instrument parts into a multitrack session to create a song. ■

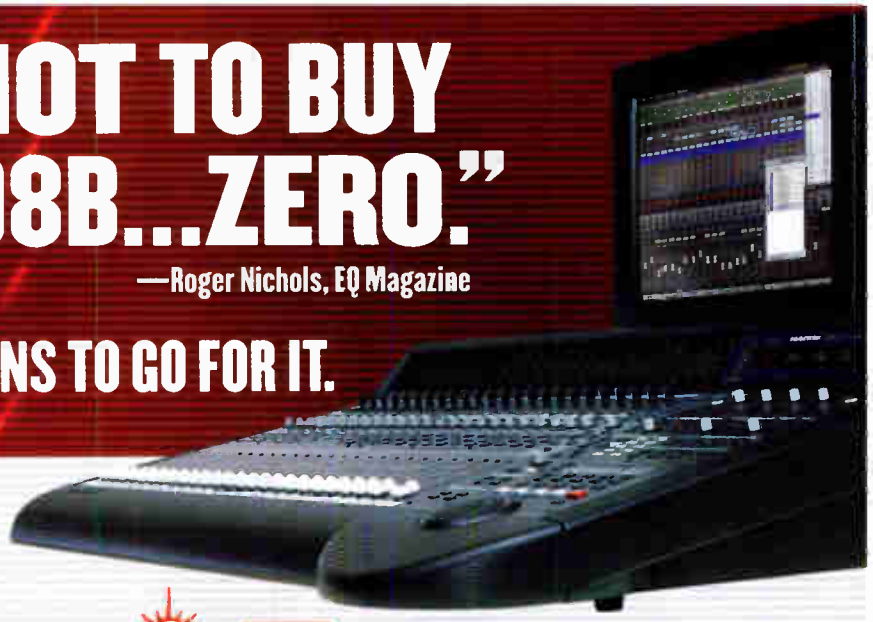
BY DAVID MILES HUBER

David Miles Huber is currently updating his book Modern Recording Techniques *to its fifth edition. His music can be found at www.51bpm.com.*

"REASONS NOT TO BUY A MACKIE D8B...ZERO."

—Roger Nichols, EQ Magazine

PLUS 3 MORE REASONS TO GO FOR IT.



1 FREE UPGRADE! NEW OS 3.0 ADDS OVER 30 NEW FEATURES!

Our Programming Department has been chugging the double lattés to create Mackie Realtime OS™ Version 3.0, packed with more new features and enhancements than you can shake a mouse at. Here's just part of what 3.0 adds to the already amazing D8B.

- **New key (sidechain) inputs** for all 48 onboard dynamic processors featuring soft knee architecture and single band 20-20k parametric EQ for frequency dependent processing such as de-essing
- **3rd-party plug-ins** via our new UFX card. Up to 16 simultaneous plug-ins on the first 48 channels, pre or post DSP, pre-fader via up to 4 UFX cards. Each plug-in is available twice — once when tracking, and again at mixdown!
- **Multiple Undo List** — 999 levels!
- New **Snapshot libraries.**
- Externally or internally accessible **inserts across Mains and Buses** plus **channel inserts pre and post DSP.**
- **Updated GUI** including 48-channel fader bank view screen.
- **Time Offset** (delay) adds a delay of up to 999 samples to the signal at the pre-DSP (dynamics / EQ) point in the signal path.
- **New surround capabilities** including depth-of-center control (LCR mixing with divergence), multiple surround panner window, individual LFE channel level control.
- **Multiple direct outs** per channel.
- **Optional level to tape** fader control.
- **Assignable, bidirectional MIDI control** of all parameters.
- **Cross patching** allows substitution of channels between various banks.

2 DSP PLUG-INS!

Antares® Auto-Tune for the D8B uses advanced DSP algorithms to detect the incoming pitch of a voice or solo instrument as it's being tracked and instantly pitch-correct it without introducing distortion or artifacts. Fully automatable.

Massenburg Parametric EQ. MDW 2x2 High-Resolution Parametric Equalizer plug-in from Grammy-winning engineer/producer George Massenburg. Mono/stereo EQ at 96kHz sample rate for unprecedented clarity and high frequency smoothness.

Drawmer offers two dynamics packages for the D8B: ADX100 includes their industry standard frequency conscious gating, plus compression and limiting; ADX200 adds variable "Peak Punch" and further Drawmer innovations.

IVL Technologies' VocalStudio provides real time vocal doubling, multi-part harmonies and pitch correction in an easy-to-use interface. A free demo is built-into the Digital 8•Bus. Just add a second MFX card to own this innovative plug-in from a world leader in vocal processing.

TC Electronic Reverb (bundled with the D8B UFX card) provides Reverb 1 and Reverb 2 algorithms from the renowned TC Electronic M2000 Studio Effects Processor. TC FX upgrade package contains an expanded set of M2000 reverbs plus Delay, Chorus, and Pitch. TC 2000 adds the TC M2000's Reverb 3, de-essing, tremolo, phasing, and panning.

The list of top engineers and producers who use the award-winning Mackie Digital 8•Bus is growing daily. For info on the D8B, new UFX and Optical•8 cards, 3rd-party plug-ins and how D8B owners can get their free OS upgrade, visit www.mackie.com or call your local D8B dealer.

SEE US AT NAMM BOOTH #3475

3 1999 TEC AWARD WINNER!

Normally we don't name competitors in our ads. But in this case, Mix Magazine published the other nominees for the 1999 TEC Award for Outstanding Technical Achievement in Small Format Consoles: Allen & Heath's GS-3000, Digidesign's ProControl, Panasonic's WR-DA7, Spirit's Digital 328 and Yamaha's 01V. Thanks to all who helped us win this prestigious award.

MACKIE Digital Systems

www.mackie.com • 800/258-6883

CIRCLE #131 ON PRODUCT INFO CARD

William Wittman is a multi-platinum Producer/Engineer, former Staff Producer/A&R Vice President (RCA/BMG Records and Columbia/Sony Records), Musician and Songwriter. His career truly covers all the bases.

"I'll tell you a secret; I've always had a love hate relationship with near-field monitors. But these LSR's have changed all that. First, they're just easy to listen to. They've got plenty of full, real bottom, great stereo imaging, and they go loud enough to feel right. Plus, they translate incredibly well to the rest of the world. They're just *musical*. Wow; good sounding speakers I can trust! It's love-love."

LSR. Profiles

The world's most noted recording professionals discuss the world's mos advanced monitoring systems.

The Three Best Performing THX® Monitoring Systems Are Also The World's Most Applauded.

Since its introduction in 1997, the system-engineered JBL LSR Series has become a favorite choice of engineers, producers and performers, many of whom have also become its most loyal advocates. More important, this acceptance is found in every major geographic area of the recording industry; from Los Angeles and New York to Nashville and London.

LSR 32 LSR 28P LSR 12P

Monitors Whose Performance Profile Was Determined By Science, Not Opinion.

During a half century of building the most technically advanced studio monitors, JBL has developed a long list of working relationships with key recording professionals around the globe. As a direct result of this unique collaboration, these industry leaders have chosen JBL monitors more often than any other brand. Not once or twice, but consistently for decades. In fact, JBL monitors are a part of the history of recording itself. Consider as examples, the now fabled JBL 4200 and 4400 Series that, at their launch, actually defined an entirely new standard and new category of monitor. Such is the case now with the entire LSR line.

JBL PROFESSIONAL

Joel Jaffe is an award winning Enginee Producer/Composer and co-owner of Studio Recording, Inc., home to a long list of platinu and Grammy Award winning albums and artis Currently, Joel is working on DVD surround mix for some of the industry's top touring acts. L surround systems are his choice for stereo a 5.1 channel multimedia projects.

"The THX Approved 5.1 JBL LSR28P with t JBL LSR12P subwoofer provide an extreme linear response, great transients and full-frequen monitoring in a near-field set up. In addition, the L speakers allow us to be able to go between ster mixing and multi-speaker formats, which is absolut necessary today in a state-of-the-art studio."

ALL NEW LSR 25P

The Only Workstation Monitor Good Enough To Be Called LSR

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